



NASA **Acquisition Pollution Prevention (AP2)** **Program**

Management Review
February 3, 2005

NASA Headquarters, Environmental Management Division
Washington D.C.

Christina Brown
Manager, NASA Acquisition Pollution Prevention Program



Agenda

- AP2 Program Overview
- Program Review
 - Core Support
 - DoD
 - NASA
 - International
- Business Analysis
- Opportunities and Risks





AP2 Program Mission

Fostering more collaboration
across the Agency
(One NASA Initiative)

To understand and protect our home
planet (NASA Mission)

AP2 Program Mission:

To identify and validate pollution prevention technologies through joint activities that enhance mission readiness and reduce risk while minimizing duplication and associated costs.

Safety first
(NASA Core Value)

Promoting more efficient systems and
processes throughout the Agency
(One NASA Initiative)



NASA AP2 Program Review

Core Support



Core Support Activities

- **Overall Objective:** Establish and sustain robust, core infrastructure that supports all necessary AP2 program and project functions.
- **Functional Categories**
 - Program Administration
 - Regulatory Support
 - Information Management
 - Marketing



Core Support

- **FY 04 Achievements – Program Administration**

- Analyzed and integrated projects and program activities to assure alignment with the Agency P2 Program.
 - Maintained all necessary electronic tools and support material at Kennedy Space Center and offsite Contractor location.
 - New web-based NASA AP2 calendar, accessible to all AP2 staff real-time.
 - Reviewed and prepared agendas, presentations, and project development material for full program alignment.

- **FY 05 Plan**

- Same level of support



Core Support

- **FY 04 Achievements – Regulatory Support**

- **Reviewed policy, guides, handbooks, and regulatory legislation for P2 impact:**

- Continue to monitor the Waste Electrical and Electronic Equipment (WEEE) and the Restriction on Hazardous Substances (RoHS) Directives in Europe.
 - Having a reciprocal impact on U.S. regulations
 - Proposed updates to EO13148 calling for a 50% reduction of specific waste streams (including lead in electronics soldering) from baseline year beginning January 1, 2005.
 - Brominated Flame Retardants (BFRs)
 - Continue to monitor U.S.EPA NESHAP—Defense Land Systems and Miscellaneous Equipment—being developed for surface coating, cleaning, surface preparation, and depainting operations at military and NASA facilities.
 - Participated in activities with NASA's Clean Air Act Working Group
 - Attended NASA Sustainability Workshop.

- **FY 05 Plan**

- Same level of support



Core Support

- **FY 04 Achievements – Information Management**

- Web Site Administration

- NASA AP2 Program website (www.acqp2.nasa.gov) now located outside the KSC firewall → has immensely improved visibility.
- Web site used extensively for the Sept. 2004 International Pollution Prevention Workshop communications (announcements, registration, and repository for presentations).

- Back-up of Critical Electronic Files

- Continue to operate and upgrade procedures and equipment to electronically file and retrieve AP2 information
 - Continue to code, insert and track all program and project documents and records into the Document Control System (DCS)
 - ITB implemented server at Merritt Island office. Now automatic, daily backup of files and e-mail

(continued)



Core Activities – P2 Database

- **Achievements – Information Management**

- **AP2 Integrated P2 Technologies Database**

- Web-enabled Database hosted by a third party provider at www.ap2-itd.com

- FY04 Goals & Achievements:

1. Restructure, streamline and update data with potential solutions

- Original information now out of date
- Database is now more useable

2. Identify possible users beyond AP2

- Briefed the following groups:
 - JG-PP Joint Service Solvent Substitution Working Group *
 - NASA KSC Range
 - KSC Environmental Solutions Partners (contractors) *

* interested in seeing a demo of the database at one of their next meetings.

(continued)



Integrated P2 Technology Database (ITDb)

NASA AP2 - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Refresh Print View Source

Address <http://www.ap2-itsd.com/> Go Links

NASA NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

ACQUISITION POLLUTION PREVENTION (AP2) INTEGRATED TECHNOLOGY DATABASE

PLEASE LOG IN

Authorized users login here

username:

password:

Click [here](#) for general public access

Click [here](#) to request a full access password

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[Joint Group on Pollution Prevention \(JGPP\)](#)
[Army Pollution Prevention](#)
Navy Pollution Prevention (not accessible at the current time)
[Air Force Pollution Prevention](#)

NASA NASA AP2 Program
Administrator: [Cassandra Carroll](#)
NASA Official: [Christina Brown](#)
Version Number 1

Done Internet

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION | ACQUISITION POLLUTION PREVENTION (AP2) INTEGRATED TECHNOLOGY DATABASE

Role: **ANALYST** Logout

General Needs GO

Search Projects General Processes HazMat Aerosol Pollutant/Waste P2 Op's Health/Safety Compliance Scoring References Users Reports Facilities Contacts Actions

ELIMINATE/REDUCE USE OF HAZWASTE FROM PAINTING OPERATIONS - GSE

Process or System Affected	Painting GSE Hardware/GSE Hardware	Status	Pending
Method Description	Spraying painting and touch-up paint of GSE with aerosols. Generates organic solvent, cleaning waste and unused paint waste	Recommendation	
Standards Specifications	None Entered		
Potential Solutions	Potential for Powder Coating applications. The powder paint method puts a static charge on the part and the powder sticks to the component. The part is then heated and the powder melts to form a smooth surface. No volatile solvent is required to ensure a complete coating and provide necessary corrosion control.		

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Integrated P2 Technology Database (ITDb)

NASA AP2 - Microsoft Internet Explorer

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Address <http://www.ap2-itsd.com/> Go Links

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION ACQUISITION POLLUTION PREVENTION (AP2) INTEGRATED TECHNOLOGY DATABASE

Role: **SUPERUSER** [Logout](#)
U.S. Army [GO](#)

Search Projects General Processes HazMat Aerosol Pollutant/Waste P2 Op's Health/Safety Compliance Scoring References Users Reports Facilities Contacts Actions

PROJECT SEARCH

1,1,1-trichloroethane [v](#) Search by Chemical
Accident Cleanup [v](#) Search by Process

PROJECTS

Agency	Project Name	Status
General Needs	Material Substitution of Methyl Isobutyl Ketone	Pending
Jet Propulsion Labor	Material Substitution - Lead in Soldering Operations	Active
JG-PP	Alternative for CFC-113 - ODC Oxygen Line Cleaning	Active
Johnson Space Cent	Material Substitution of TCLP Metal-Based Coatings	Active
Johnson Space Cent	Material Substitution of Live Tissue Fixation	Pending
Kennedy Space Cent	Material Substitution of Methylene Chloride and Chloroform in Extractions	Pending
Kennedy Space Cent	Eliminate/Reduce use of Acids containing heavy metals - Life Sciences	Pending
Kennedy Space Cent	Eliminate/Reduce use of HazWaste in Cable Fabrication	Researching
Kennedy Space Cent	Material Substitution of Hexane in Photo Cleaning	Pending
Langley Research C	Material substitution of CFC-113 - Cleaning Oxygen Systems	Pending
Langley Research C	Material Substitution of chromate conversion coatings	Pending
Marshall Space Flight	Material Substitution of CFC-113	Active

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NASA Official: [Christina Brown](#)
Version Number 1

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Core Activities – P2 Database

- **Achievements – Information Management**
 - **AP2 Integrated P2 Technologies Database**
 - Plans for FY 05
 - Demonstrate the database to ESP partners interested in using the database
 - Identify changes that will need to be made to suit users within KSC and other NASA/DoD stakeholders
 - If partners are identified and funding secured, implement upgrades to the database and being population of current data to the system.



Core Support

• FY 04 Achievements – Marketing

- Presented papers and/or presentations at both old & new venues in FY 04 (e.g., ITT, Soc. of Logistics Engineers, NASA-C3P Workshop)
- Continued fostering new and existing relationships (e.g., Air Force Corrosion Prevention Advisory Board, JSSSWG, U.S. Coast Guard, Redstone Arsenal)
 - Overall benefit: Marketing is paying off → broadening network
 - Bringing in new stakeholders on AP2 projects
 - Identifying potential new projects
 - Air Force Space Command collaborating more with NASA AP2
 - Unsolicited invitations to technology reviews and demos (PPG, USA)
 - Lead-free solder Web page is the most visited page on the JG-PP Web site
- AP2 contractor solicitation process resulted in some beneficial acquaintances

(continued)



Core Support

- **FY 05 Plans – Marketing**

- Seek venues to make presentations and continue building professional network
 - Leading exhibition of JG-PP booth at JSEM, Tampa, April 2005
 - Lead-free solder team presentations at least two U.S. electronics conferences
 - Possible ISQ C3P brief at EUROCORN (European corrosion) conference in Lisbon in early September 2005
- Lead-free solder article awaiting publication in a lead-free journal by ACI; plan to submit version to *NASA TechBriefs*



DoD Business Entity



DoD Support Activities

- **Overall Objective:** Leverage resources with the DoD, primarily the Joint Group on Pollution Prevention (JG-PP); to maintain environmental technology cooperation and qualify shared alternative material and process solutions that are less or non-hazardous to the environment.
- **Functional Categories**
 - JG-PP Working Group/ Program Support
 - JG-PP Project Support
 - Manage and Support Active Projects
 - Identify P2 Needs and Develop Projects



DoD Support

- **Achievements – JG-PP Working Group/ Program Support**
 - Added U.S. AFSPC as stakeholders to the following two NASA-only projects. Obtained JG-PP WG approval to label the two projects as “JG-PP supported” projects:
 - Alternatives to Aliphatic Isocyanate Polyurethanes
 - Low Emission Surface Preparation/Depainting On Structural Steel
 - Supported JG-PP WG preparations for Jan. 2005 Joint Logistics Commanders (JLC) meeting.

(continued)



DoD Support

- **FY 04 Achievements – JG-PP Working Group/ Program Support**

- New Navy WG rep has performed outstanding job for JG-PP. However, JG-PP progress in some areas is stagnant.
- Resulting action taken in FY 04:
 - NASA AP2 provided input on ideas for FY 05 projects
 - NASA AP2 provided proactive suggestions to Working Group that JG-PP needs to do strategic planning
 - Identified areas of improvement (by WG members)
 1. Improve JG-PP internal functioning and operability
 2. Improve JG-PP project selection
 3. How can JG-PP engage the acquisition community and new weapons/space systems?
 4. Improve funding for projects
 5. Increase high DoD-level awareness of JG-PP
 6. Ensure active projects stay on track (cost, schedule and scope control)
- WG strategic planning meeting Feb. 1- 2, 2005






NASA AP2

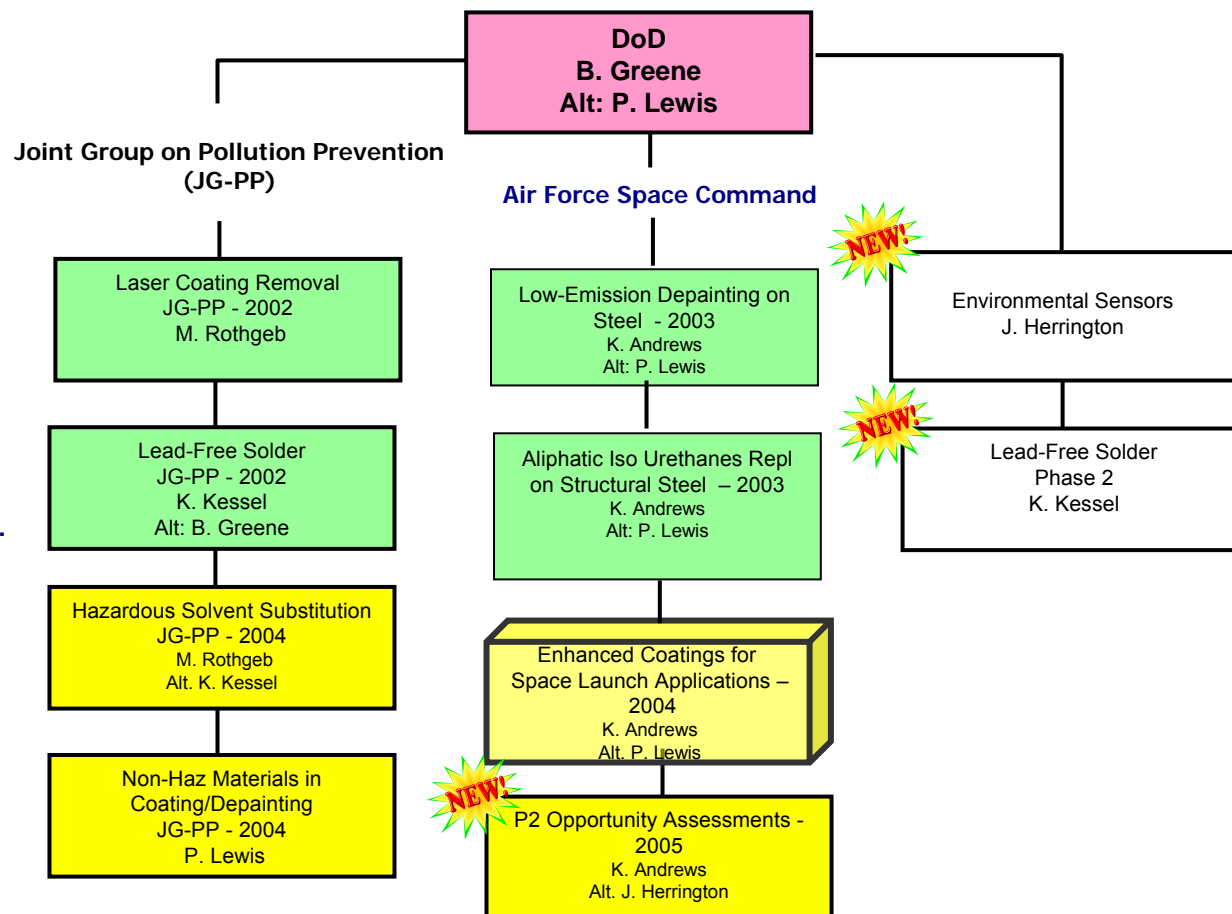
FY 2004 DoD Business Entity Projects and ITB POCs

FY 04 DoD-NASA Projects Summary

Two formerly NASA-only projects (Depainting & Urethanes) were re-labeled as DoD projects in FY04 following the addition of AFSPC as a stakeholder. Several ideas for new projects are in development.

-  = active project
-  = developing project
-  = future consideration

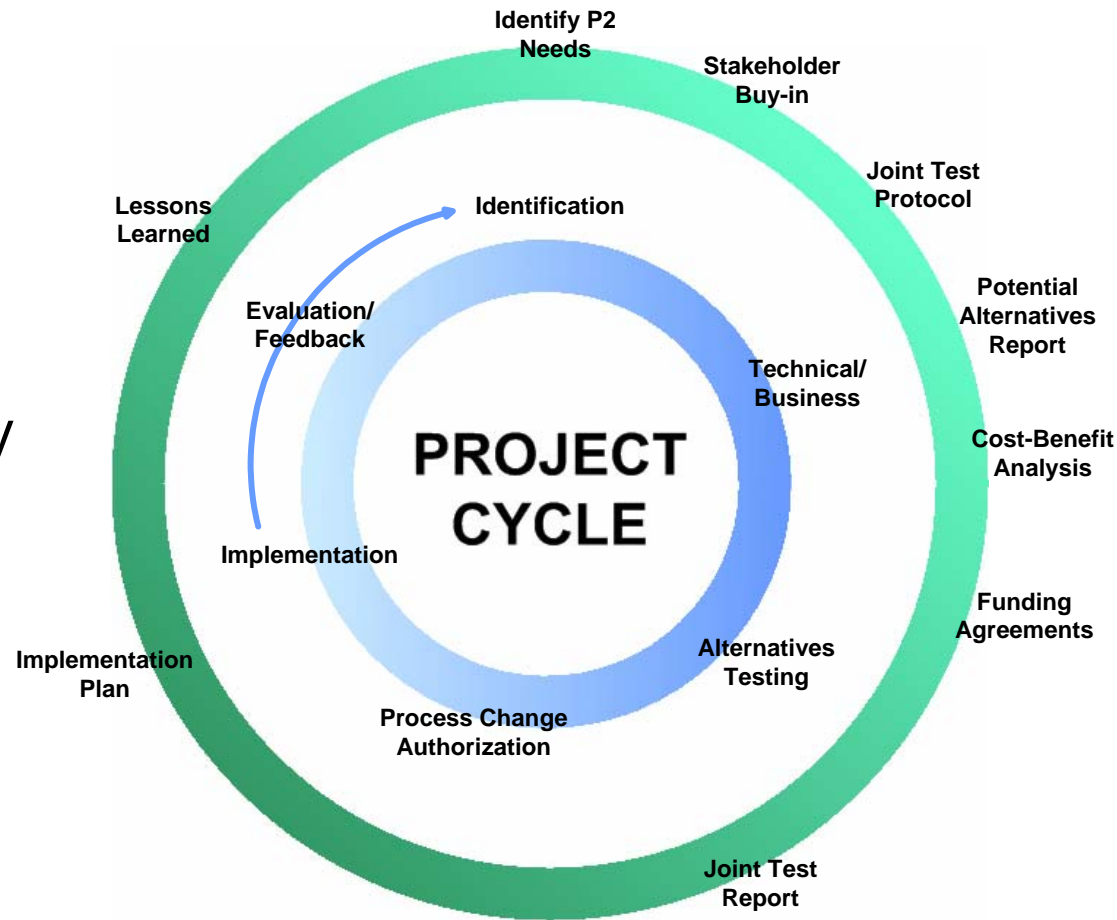
3D blocks = change in status





All projects follow a proven 6-step methodology

Project Methodology





DoD-NASA Projects Review



JG-PP/ESTCP Portable Laser Coating Removal System

Description:

- Demonstrate the feasibility of a portable laser system for removing various coatings on metal and composite substrates for use in small-area depot applications.

Stakeholders:

- Air Force, Army, Navy, Marine Corps, NASA

Benefits:

- Compared to current methods, lasers can reduce down time of equipment and hazardous waste generation.
- Testing results used by NASA in follow-on project → reduced duplication
- ESTCP provided substantial funding



FY 04 Achievements:








- Three lasers demonstrated at LHMEI
- Field demonstration of handheld lasers performed at Tinker AFB, Hill AFB, Warner Robins AFB, and Corpus Christi Army Depot
 - Users feedback from demo was very favorable
 - Demonstration to the Command P2 Weapon System Center Working Group

Future Plans:

- AFMC/LGP inserted LASER technology in long term depot strategy
- Working with TO 1-1-8 owners to incorporate laser technology
- Both Tinker AFB (KC-135, B-52, and E-3 SPO) and Hill AFB (F-16 and A-10 SPO) procured two handheld lasers
- Army (Fort Rucker) has initiated plans for implementation
- **Project will close in FY 05**



DoD Portable Laser Coating Removal System – Activity & Status

ACTIVITY	STATUS	RESULT
Portable Hand Held Laser Coating Removal System		
Paint Stripping	100 % Complete	
Testing of Metallic Panels	100 % Complete	
Testing of Composite Panels	100 % Complete	
Toxicity Testing	100 % Complete	
Safety Plan	100 % Complete (Coordinating with SE/SG)	
Fire/Explosion Testing	100 % Complete	
Field Demonstrations	100 % Complete	
Final Report	January 2005	



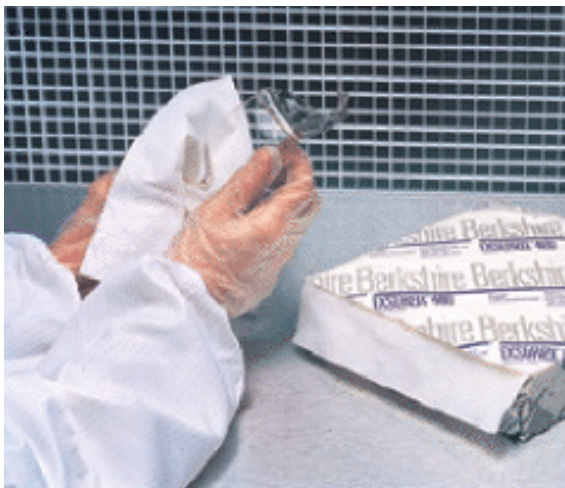
JG-PP Hazardous Solvent Substitution (Project Opportunity)

Objective:

- Reduce VOCs and HAPs that comprise in whole, or exist as constituents in solvent applications. Activities, such as cleaning prior to painting and adhesive or bonding applications, as well as cleaning radomes/ composites and fuel cells will take highest priority in the investigation of wipe-down solvents.

Stakeholders:

- NASA, Air Force, Army, Navy, Marines



Benefits:

- Joint effort for solvent replacement across DoD for similar processes should produce a cost savings.
- Clear methodology for selection of any identified alternatives that all agencies agree with.

FY 04 Achievements:

- Began solvent substitution project development phase
- Completed first version of Database for stakeholder review
- Completed Methodology for stakeholders to endorse.

Future Plans:

- Populate database
- Endorse Methodology
- Plan for qualification testing for solvents.



JG-PP Non-Haz Materials in Coating/Depainting (Project Opportunity)

Objective:

- To identify new coating/depainting project opportunities, evaluate them, and to make recommendations to the JG-PP WG

Stakeholders:

- NASA, Air Force, Army, Navy, Marines



Benefits:

- Reduced hazardous materials and associated costs
- Reduced worker exposure and associated costs

FY 04 Achievements:

- Each of the Services and NASA submitted proposed projects
- The consolidated list of projects was distributed for review and ranking based on interest

Future Plans:

- Recommend specific projects to the JG-PP WG
- Begin projects approved by JG-PP WG
- Look for synergy between AFSPC and JG-PP opportunities



P2 Opportunity Assessments Complex 17 CCAFS (Project Opportunity)

Description

- Depainting PPOA at Complex 17 A and B Cape Canaveral AFS in 2005. Under this tasking the NASA AP2 Program shall furnish the personnel, services, equipment, materials, facilities, and other requirements necessary for, or incidental to, the identification of Depainting P2 opportunities.

Stakeholders:

- NASA AP2, AFSCP2, CCAFS, Patrick AFB



Benefits:

- The AFSPC goal of this project is to establish clarification on the existing depainting processes utilized on the launch structures at Complex 17 A&B CCAFS and to support the identification of new or existing technologies or processes that may potentially satisfy the P2 needs herein identified.

FY 04 Achievements:

The following draft documents have been generated, and are currently under review:

- Statement of Work
- Project Schedule

Future Plans:

- Process \$50K MIPR from AFSPC (expect Feb. 2005)



P2 Opportunity Assessments @ CCAFS – Funding

AFSPC P2 Opportunity Assessments

Reporting Date: December 31, 2004

Gov't Project Manager: Terry Self, 45th SW

Status: **Proposed (project in development)**

AP2 POC: Kevin Andrews, ITB

Project Initiation Date ###/##

(FY = AP2 FY - starts in April)

Notes:

FY05 POP

\$50,000: MIPR from HQ AFSPC, via 45SW to NASA AP2

DIRECT FUNDING					
Source	Prior Years	FY 2004	FY 2005 POM	FY 2006 POM	Total Direct Funding
NASA AP2	\$ -	\$ -	\$ -	\$ -	\$ -
NASA Other	\$ -	\$ -	\$ -	\$ -	\$ -
Air Force	\$ -	\$ -	\$ 50,000	\$ -	\$ 50,000
Army	\$ -	\$ -	\$ -	\$ -	\$ -
Marines	\$ -	\$ -	\$ -	\$ -	\$ -
Navy	\$ -	\$ -	\$ -	\$ -	\$ -
Other Gov't (e.g., ESTCP)	\$ -	\$ -	\$ -	\$ -	\$ -
Non-Gov't (e.g., OEMs)	\$ -	\$ -	\$ -	\$ -	\$ -
Hill AFB	\$ -	\$ -	\$ -	\$ -	\$ -
TOTALS	\$ -	\$ -	\$ 50,000	\$ -	\$ 50,000

IN-KIND CONTRIBUTIONS						
Source	Prior Years	FY 2004	FY 2005 POM	FY 2006 POM	Total In-Kind	Total Budget
NASA AP2	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
NASA Other	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Air Force	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 50,000
Army	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Marines	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Navy	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Other Gov't (e.g., ESTCP)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Non-Gov't (e.g., OEMs)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Hill AFB	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTALS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 50,000

EXPENDITURES	Prior Years	FY 2004	FY 2005	FY 2006	Total Rec'd	Spent+ Committed	Balance
NASA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Other Gov't Agencies	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
ITB	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Other Contractor	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Non-Gov't (e.g., OEMs)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Other	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTALS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -



Low Emission Depainting on Steel (NASA-AFSPC)



Description:

- Goal is to validate alternative Low Emission Surface Preparation/Depainting technologies for Structural Steel
- Current methods involve high-dusting abrasive blasting
- Applicable Regs.: OSHA, NIOSH, ACGIH

Stakeholders:

- Kennedy Space Center, Stennis Space Center, Air Force Space Command



Benefits:

- Improved corrosion protection of critical systems
- Easier and less costly maintenance, reduced flight hardware contamination, and reduced haz. waste
- Reduced costs associated with current maintenance activities across NASA
- Forecasted 4:1 return on NASA investment through FY 06

FY 04 Achievements:

- Identified key stakeholders and benefits.
- Distributed PAR, JTP and Field Test Plan
- Began penning CBA
- Procured materials and prepared coupons for testing

Future Plans:

- Initiate first stages of field and laboratory testing (March 2005)
- **Address unfunded requirements (\$20K) for FY05**



NASA AP2 Coatings and Depainting Project Schedule					2003								2004				2005	
ID	Task Name	Duration	Start	Finish	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2				
1	Surface preparation/depainting	690 days	Mon 07/07/03	Fri 02/24/06														
2	Technical	345 days	Mon 07/07/03	Fri 10/29/04														
3	Technical Telecon #1	0 days	Wed 07/09/03	Wed 07/09/03														
4	Identify Technical Specifications	11 days	Wed 07/16/03	Wed 07/30/03														
5	Draft Requirements Matrix/ Survey Form	15 days	Wed 07/30/03	Tue 08/19/03														
6	Technical Telecon #2	0 days	Wed 08/20/03	Wed 08/20/03														
7	Final Requirements Matrix/ Survey Form	4 days	Wed 08/20/03	Mon 08/25/03														
8	1st Draft (Strawman) JTP	26 days	Wed 08/27/03	Wed 10/01/03														
9	Technical Telecon #3	0 days	Wed 10/01/03	Wed 10/01/03														
10	2nd Draft JTP	15 days	Mon 10/06/03	Fri 10/24/03														
11	1st Draft PAR	20 days	Mon 10/27/03	Fri 11/21/03														
12	KSC Face to Face	0 days	Mon 11/03/03	Mon 11/03/03														
13	SSC Face to Face	0 days	Wed 12/03/03	Wed 12/03/03														
14	1st Draft Field Test Plan	15 days	Mon 01/26/04	Fri 02/13/04														
15	2nd Draft PAR	21 days	Mon 01/26/04	Mon 02/23/04														
16	3rd Draft JTP	15 days	Mon 02/02/04	Fri 02/20/04														
17	2nd Draft Field Test Plan	10 days	Mon 02/16/04	Fri 02/27/04														
18	KSC Face to Face	0 days	Tue 06/15/04	Tue 06/15/04														
19	SSC Face to Face	0 days	Thu 06/17/04	Thu 06/17/04														
20	Final JTP	91 days	Mon 09/27/04	Mon 01/31/05														
21	Final Field Test Plan	91 days	Mon 09/27/04	Mon 01/31/05														
22	1st Draft CBA	80 days	Mon 10/04/04	Fri 01/21/05														
23	Final PAR	115 days	Mon 09/27/04	Fri 03/04/05														
24	Final CBA	65 days	Mon 01/24/05	Fri 04/22/05														
25	Alternative Dem/Val	170 days	Mon 10/04/04	Fri 05/27/05														
26	Testing Preparation	105 days	Mon 10/04/04	Fri 02/25/05														
27	Testing	60 days	Mon 03/07/05	Fri 05/27/05														
28	Joint Test Report	56 days	Mon 06/06/05	Mon 08/22/05														
29	Write JTR	30 days	Mon 06/06/05	Fri 07/15/05														
30	Submit draft JTR for review	25 days	Mon 07/18/05	Fri 08/19/05														
31	Incorporate stakeholder input	15 days	Mon 08/22/05	Fri 09/09/05														
32	Submit Final copy of JTR	0 days	Mon 09/19/05	Mon 09/19/05														
33	Implementation	105 days	Mon 10/03/05	Fri 02/24/06														

30



Low Emission Depainting on Steel – Funding

DoD-NASA Low-Emission Depainting

Reporting Date: December 31, 2004

Gov't Project Manager: {e.g., Chris Brown}

Status: Active

AP2 POC: Kevin Andrews, ITB

Project Initiation Date 08/09/04

(FY = AP2 FY - starts in April)

Notes:

\$16,726: FY03 AP2 funding

\$60,850: FY04 funding to procure materials, prepare coupons, and pay for KSC/Stennis testing

FY05 POP

\$20,000: Stennis funding to support field activities

\$400,000: Anticipated AFSPC funding for scope expansion

DIRECT FUNDING					
Source	Prior Years	FY 2004	FY 2005 POM	FY 2006 POM	Total Direct Funding
NASA AP2	\$ 16,726	\$ 60,850	\$ -	\$ -	\$ 77,576
NASA Other	\$ -	\$ -	\$ 20,000	\$ -	\$ 20,000
Air Force	\$ -	\$ -	\$ -	\$ 400,000	\$ 400,000
Army	\$ -	\$ -	\$ -	\$ -	\$ -
Marines	\$ -	\$ -	\$ -	\$ -	\$ -
Navy	\$ -	\$ -	\$ -	\$ -	\$ -
Other Gov't (e.g., ESTCP)	\$ -	\$ -	\$ -	\$ -	\$ -
Non-Gov't (e.g., OEMs)	\$ -	\$ -	\$ -	\$ -	\$ -
TOTALS	\$ 16,726	\$ 60,850	\$ 20,000	\$ 400,000	\$ 497,576

IN-KIND CONTRIBUTIONS						Total Budget
Source	Prior Years	FY 2004	FY 2005 POM	FY 2006 POM	Total In-Kind	
NASA AP2	\$ 12,351	\$ 33,880	\$ -	\$ -	\$ 46,231	\$ 123,807
NASA Other	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 20,000
Air Force	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 400,000
Army	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Marines	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Navy	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Other Gov't (e.g., ESTCP)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Non-Gov't (e.g., OEMs)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTALS	\$ 12,351	\$ 33,880	\$ -	\$ -	\$ 46,231	\$ 543,807

EXPENDITURES	Prior Years	FY 2004	FY 2005	FY 2006	Total Rec'd	Spent+ Committed	Balance
NASA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Other Gov't Agencies	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
ITB	\$ 12,351	\$ 33,880	\$ -	\$ -	\$ 46,231	\$ 46,231	\$ -
Other Contractor (ASRC)	\$ 16,726	\$ 60,850	\$ -	\$ -	\$ 77,576	\$ 77,576	\$ -
Non-Gov't (e.g., OEMs)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Other	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTALS	\$ 29,077	\$ 94,730	\$ -	\$ -	\$ 123,807	\$ 123,807	\$ -



Alternatives to Aliphatic Isocyanate Urethanes

Description:

- Goal is to validate alternatives to isocyanate urethanes
- Currently isocyanate urethanes are used across NASA on structural and non-structural elements in both shuttle and non-shuttle programs
- Applicable Regs.: OSHA, NIOSH, ACGIH

Stakeholders:

- Kennedy Space Center, Stennis Space Center, Air Force Space Command



Benefits:

- Eliminates environmental, safety, and health concerns with use of isocyanate urethanes
- Forecasted 1.8:1 return on NASA's investment through FY 06

FY 04 Achievements:

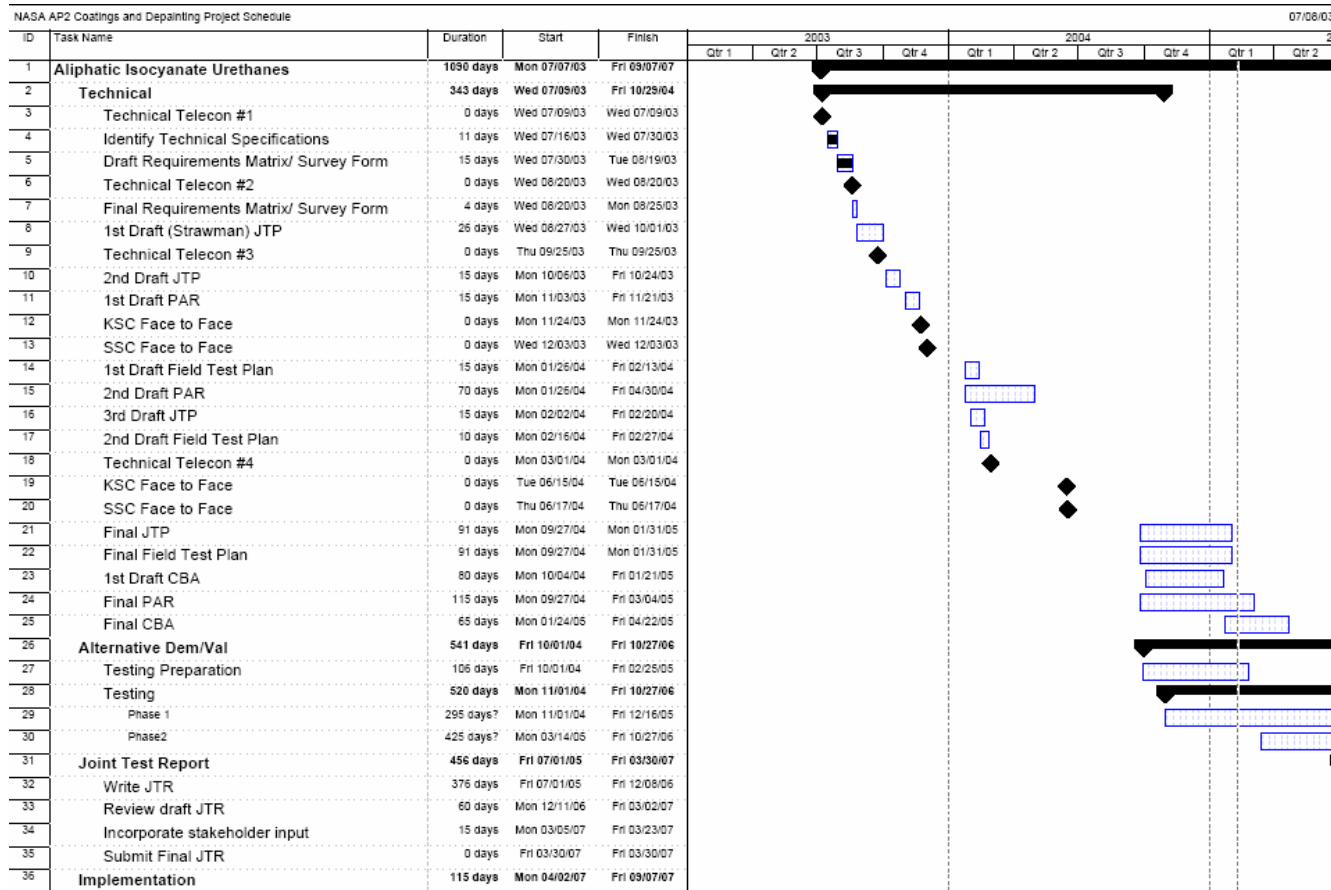
- Identified key stakeholders and benefits.
- Distributed PAR JTP and Field Test Plan
- Began penning CBA
- Procured materials and prepared coupons for testing

Future Plans:

- Initiate first stages of field and laboratory testing (March 2005)
- AFSPC to provide \$110K funding
- **Address unfunded requirements (\$145K) for FY05**



Alternatives to Aliphatic Isocyanate Urethanes – Schedule



The scheduled project completion date has not changed; however, some subtask completion dates have been extended by approximately three (3) weeks. The subtask schedules were adjusted to account for delays in responses from stakeholders to review and provide comments on the Joint Test Protocol, Field Test Plan, and potential alternatives. The subtask delays did not affect the overall project completion date because the actual start date for testing was not scheduled until March to reflect the contractor's availability and to take advantage of optimum weather conditions.



Alternatives to Aliphatic Isocyanate Urethanes – Funding

Notes:

\$37,383: NASA P2 funding to purchase lab coupons

\$37,000: Funding required to buy materials for field testing

FY05 POP

\$125,000: Projected FY 05 need (unfunded requirement)

\$20,000: Stennis contribution for contract labor (unfunded requirement)

\$110,000: AFSPC FY 05 requirement (unfunded requirement)

DoD-NASA Isocyanate Urethane Coatings Replacement on Steel

Reporting Date: December 31, 2004

Gov't Project Manager: {e.g., Chris Brown}

Status: Active

AP2 POC: Kevin Andrews, ITB

Project Initiation Date 08/09/04

(FY = AP2 FY - starts in April)

DIRECT FUNDING					
Source	Prior Years	FY 2004	FY 2005 POM	FY 2006 POM	Total Direct Funding
NASA AP2	\$ -	\$ 37,383	\$ 125,000	U \$ -	\$ 162,383
NASA Other	\$ -	\$ 37,000	\$ 20,000	U \$ -	\$ 57,000
Air Force	\$ -	\$ -	\$ 110,000	U \$ -	\$ 110,000
Army	\$ -	\$ -	\$ -	\$ -	\$ -
Marines	\$ -	\$ -	\$ -	\$ -	\$ -
Navy	\$ -	\$ -	\$ -	\$ -	\$ -
Other Gov't (e.g., ESTCP)	\$ -	\$ -	\$ -	\$ -	\$ -
Non-Gov't (e.g., OEMs)	\$ -	\$ -	\$ -	\$ -	\$ -
	\$ -	\$ -	\$ -	\$ -	\$ -
TOTALS	\$ -	\$ 74,383	\$ 255,000	\$ -	\$ 329,383

IN-KIND CONTRIBUTIONS

Source	Prior Years	FY 2004	FY 2005 POM	FY 2006 POM	Total In-Kind	Total Budget
NASA AP2	\$ 12,351	\$ 33,880	\$ -	\$ -	\$ 46,231	\$ 208,614
NASA Other	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 57,000
Air Force	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 110,000
Army	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Marines	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Navy	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Other Gov't (e.g., ESTCP)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Non-Gov't (e.g., OEMs)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTALS	\$ 12,351	\$ 33,880	\$ -	\$ -	\$ 46,231	\$ 375,614

EXPENDITURES	Prior Years	FY 2004	FY 2005	FY 2006	Total Rec'd	Spent+ Committed	Balance
NASA	\$ -	\$ 37,000	\$ -	\$ -	\$ 37,000	\$ 37,000	\$ -
Other Gov't Agencies	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
ITB	\$ 12,351	\$ 33,880	\$ -	\$ -	\$ 46,231	\$ 46,231	\$ -
Other Contractor (ASRC)	\$ -	\$ 37,383	\$ -	\$ -	\$ 37,383	\$ 37,383	\$ -
Non-Gov't (e.g., OEMs)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Other	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTALS	\$ 12,351	\$ 108,263	\$ -	\$ -	\$ 120,614	\$ 120,614	\$ -



Enhanced Coatings for Space Launch Applications (DoD-NASA Project Opportunity)

Objective:

- Demonstrate coating(s) for NASA facilities and Shuttle operations, AF Space Command Range & Space Lift Operations, and AF weapons system maintenance

Stakeholders:

- NASA, Air Force



Benefits:

- Reduced hazardous materials, worker exposure, and associated costs
- Propose project as a way to test the Akzo-Noble coating system for NASA
- Forecasted 3:1 return on NASA investment

FY 04 Achievements:

- Identified technical representatives from KSC (Shuttle), Patrick AFB, Vandenberg AFB, AF Space Command, Hill AFB, and Malmstrom AFB

Future Plans:

- Define application and performance requirements
- Solidify stakeholder interest and estimate funding/resource requirements
- AFSCP to contribute \$22K in FY05
- \$5K expected from NASA PH (Shuttle) in FY05
- A trip to Hill AFB is anticipated in 2005 to support a project stakeholder meeting.



External Coatings for Space Launch Applications –Funding

DoD-NASA External Coatings (Kimetsan) for Space Launch Applications

Reporting Date: December 31, 2004

Gov't Project Manager: {e.g., Chris Brown}

Status: **Proposed (project in development)**

AP2 POC: Kevin Andrews, ITB

Project Initiation Date 11/22/04

(FY = AP2 FY - starts in April)

Notes:

\$30,000: NASA P2 FY04 funding, for corrosion testing by KSC Corrosion Test Facility

FY05 POP

\$5,000: PH (Shuttle) FY05 funding

\$22,000: \$10K AFSPC and \$12K Hill AFB FY 05

DIRECT FUNDING					
Source	Prior Years	FY 2004	FY 2005 POM	FY 2006 POM	Total Direct Funding
NASA AP2	\$ -	\$ 30,000	\$ -	\$ -	\$ 30,000
NASA Other	\$ -	\$ -	\$ 5,000	\$ -	\$ 5,000
Air Force	\$ -	\$ -	\$ 22,000	\$ -	\$ 22,000
Army	\$ -	\$ -	\$ -	\$ -	\$ -
Marines	\$ -	\$ -	\$ -	\$ -	\$ -
Navy	\$ -	\$ -	\$ -	\$ -	\$ -
Other Gov't (e.g., ESTCP)	\$ -	\$ -	\$ -	\$ -	\$ -
Non-Gov't (e.g., OEMs)	\$ -	\$ -	\$ -	\$ -	\$ -
TOTALS	\$ -	\$ 30,000	\$ 27,000	\$ -	\$ 57,000

IN-KIND CONTRIBUTIONS						
Source	Prior Years	FY 2004	FY 2005 POM	FY 2006 POM	Total In-Kind	Total Budget
NASA AP2	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 30,000
NASA Other	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 5,000
Air Force	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 22,000
Army	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Marines	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Navy	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Other Gov't (e.g., ESTCP)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Non-Gov't (e.g., OEMs)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Hill AFB	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTALS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 57,000

EXPENDITURES	Prior Years	FY 2004	FY 2005	FY 2006	Total Rec'd	Spent+ Committed	Balance
NASA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Other Gov't Agencies	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
ITB	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Other Contractor (ASRC)	\$ -	\$ 30,000	\$ -	\$ -	\$ 30,000	\$ 30,000	\$ -
Non-Gov't (e.g., OEMs)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Other	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTALS	\$ -	\$ 30,000	\$ -	\$ -	\$ 30,000	\$ 30,000	\$ -



Environmental Sensors (Project Opportunity)

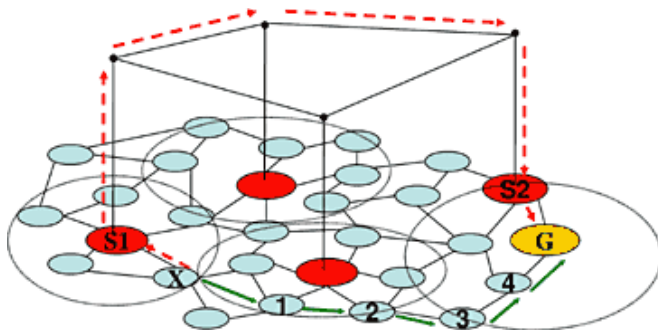


Description

- Demonstrate and Validate the use of Radio Frequency Identification Device (RFID) real time sensors in monitoring and managing hazardous materials storage and usage.
- Prevent/minimize spills of hazardous waste. Automated notification of emergency situations, provide hazardous information to responders. Monitor shelf life and environmental conditions of materials.

Stakeholders:

- NASA DFRC and MSFC
- Hill AFB
- Eventually all DoD and
- NASA Homeland Security Dept.



Benefits:

- Prevent/minimize spills of hazardous materials
- Immediate Notification of emergency situations
 - Notify Fire Dept. HAZMAT Response
 - Notify Facility Managers/Police
 - Identifies hazardous and PPE necessary for responses
- Prevents storage of outdated materials
- Technology can branch off in to unlimited remote Environmental Management technologies.

FY 04 Achievements:

- Investigated initial capabilities/ proof of concept.
- Drafted ESTCP proposal outline, AP2 assessment shows technology to be viable.

Future Plans:

- Draft and Submit ESTCP proposal for Phase II study and technology Dem/Val.



Lead-Free Solder Project (NASA-Aging Aircraft)

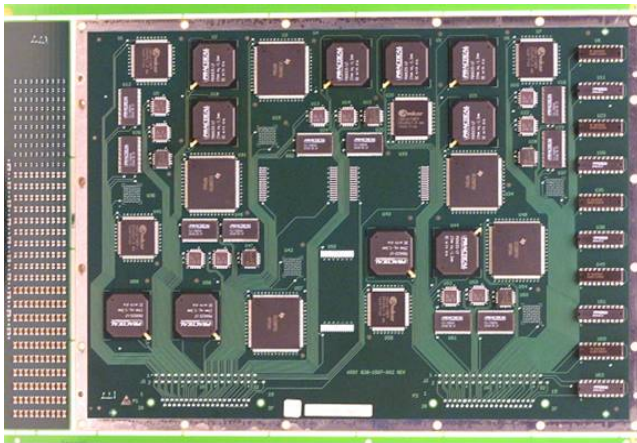


Description:

- Joint DoD-NASA-OEM project to provide baseline data to allow eventual qualification and validation of lead-free solder alloys for use in manufacture and repair of electronic equipment
- Consumer electronics are driving commercial market to lead-free alternatives

Stakeholders:

- NASA KSC, JPL, MSFC, JSC, GSFC, ARC, USA-SRB, Boeing-Orbiter
- Air Force, Army, Navy, Marines, Dept. of Energy
- More than 25 manufacturers and vendors



Benefits:

- Estimated 5-to-1 return for NASA (\$600K NASA investment in \$3M project)
- NASA AP2 becoming focal point for new Agency, DoD, and International lead-free solder initiatives
- JTP meets NASA core testing needs (confirmed buy-in from NASA MSFC, Boeing/Orbiter, JPL)

FY 04 Achievements:

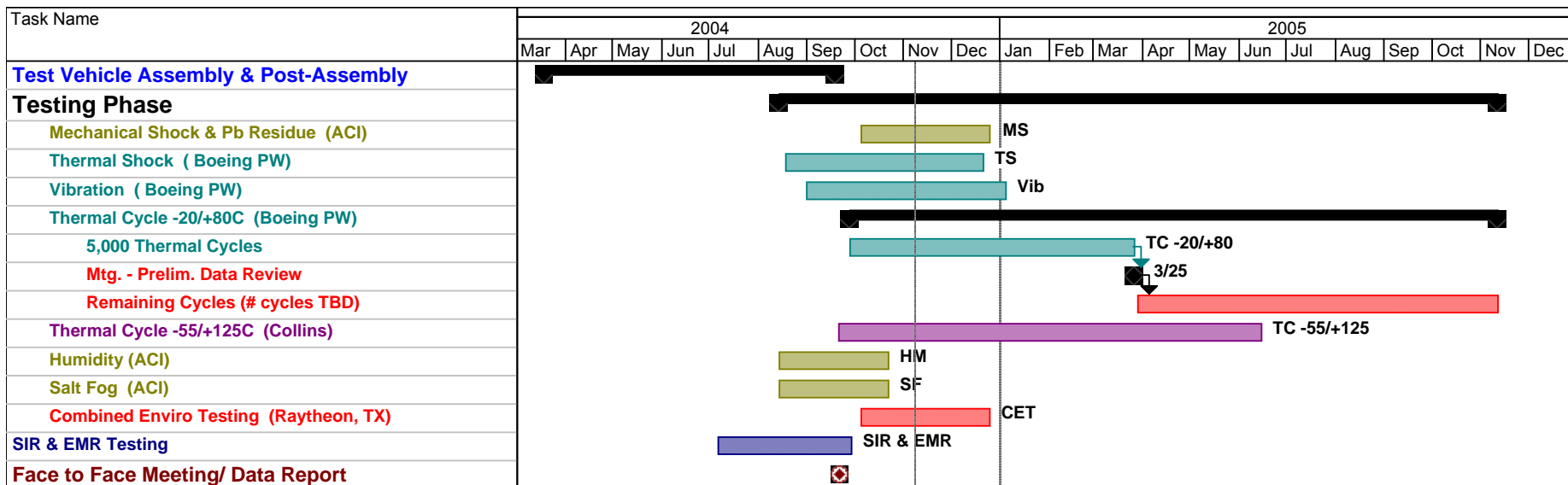
- Materials procurement and testing fully funded
- Test vehicle build completed. Soldered 75,513 components onto 205 boards
- All testing began in Aug. 2004.
- No conclusions yet, but expected by 2Q 2005.

Future Plans:

- Complete testing
- Analyze data and prepare Joint Test Report
- **Close this “Phase 1” project in FY 05**
- Develop implementation plans and/or need for future work (“Phase 2”)



Lead-Free Solder Project – Schedule



Project remains on schedule.



Upcoming Lead-Free Solder Presentations

Test data from the JCAA/JG-PP LFS project will be presented by multiple team members at the following premier electronics conferences in 2005:

Event	Date	Location
IPC/JEDCE 8th International LF Conference on Electronic Components and Assemblies	April 18-20, 2005	San Jose, California
SMTA International 2005	Sept. 25-29, 2005	Rosemont, Illinois



Lead-Free Solder Project – Funding

Notes:

\$343,600: Funding provided by NASA for procurement and Mech Shock testing

\$425,000: Funding received from Aging Aircraft to pay for testing procedures

\$75,000: Initial project funding provided by Navy

\$17,202: Initial project funding provided by ESTCP

\$50,000: BAE Systems (U.K.) contribution to Raytheon CE testing

\$857,687: Stakeholders attending meetings including travel expenses, plus in-kind for build and testing

DoD-NASA Lead Free Solder

Reporting Date: December 31, 2004

Status: Active

Project Initiation Date 6/01

Gov't Project Manager: Rich Hricko, AF/Aleon

AP2 POC: Kurt Kessel, ITB

(FY = AP2 FY - starts in April)

DIRECT FUNDING						
Source	Prior Years	FY 2004	FY 2005 POM		FY 2006 POM	Total Direct Funding
NASA AP2	\$ 343,600	\$ -	\$ -	U	\$ -	\$ 343,600
NASA Other	\$ -	\$ -	\$ -		\$ -	\$ -
Air Force	\$ 440,279	\$ 65,000	\$ -	U	\$ -	\$ 505,279
Army	\$ -	\$ -	\$ -		\$ -	\$ -
Marines	\$ -	\$ -	\$ -		\$ -	\$ -
Navy	\$ 75,000	\$ -	\$ -		\$ -	\$ 75,000
Other Gov't (e.g., ESTCP)	\$ 17,202	\$ -	\$ -		\$ -	\$ 17,202
Non-Gov't (e.g., OEMs)	\$ -	\$ 50,000	\$ -		\$ -	\$ 50,000
	\$ -	\$ -	\$ -		\$ -	\$ -
TOTALS	\$ 876,081	\$ 115,000	\$ -		\$ -	\$ 991,081

IN-KIND CONTRIBUTIONS

Source	Prior Years	FY 2004	FY 2005 POM		FY 2006 POM	Total In-Kind	Total Budget
NASA AP2	\$ 159,510	\$ 101,033	\$ -		\$ -	\$ 260,543	\$ 604,143
NASA Other	\$ -	\$ -	\$ -		\$ -	\$ -	\$ -
Air Force	\$ 5,335	\$ 31,350	\$ -		\$ -	\$ 36,685	\$ 541,964
Army	\$ -	\$ -	\$ -		\$ -	\$ -	\$ -
Marines	\$ -	\$ -	\$ -		\$ -	\$ -	\$ -
Navy	\$ -	\$ -	\$ -		\$ -	\$ -	\$ 75,000
Other Gov't (e.g., ESTCP)	\$ -	\$ -	\$ -		\$ -	\$ -	\$ 17,202
Non-Gov't (e.g., OEMs)	\$ 769,297	\$ 857,687	\$ -		\$ -	\$ 1,626,984	\$ 1,676,984
	\$ -	\$ -	\$ -		\$ -	\$ -	\$ -
TOTALS	\$ 934,142	\$ 990,070	\$ -		\$ -	\$ 1,924,212	\$ 2,915,293

EXPENDITURES	Prior Years	FY 2004	FY 2005		FY 2006	Total Rec'd	Spent+ Committed	Balance
NASA	\$ -	\$ -	\$ -		\$ -	\$ -	\$ -	\$ -
Other Gov't Agencies	\$ -	\$ -	\$ -		\$ -	\$ -	\$ -	\$ -
ITB	\$ 948,724	\$ 132,383	\$ -		\$ -	\$ 1,081,107	\$ 1,081,107	\$ -
Other Contractor	\$ 92,202	\$ -	\$ -		\$ -	\$ 92,202	\$ 92,202	\$ -
Non-Gov't (e.g., OEMs)	\$ 769,297	\$ 907,687	\$ -		\$ -	\$ 1,676,984	\$ 1,676,984	\$ -
Other	\$ -	\$ -	\$ -		\$ -	\$ -	\$ -	\$ -
	\$ -	\$ -	\$ -		\$ -	\$ -	\$ -	\$ -
TOTALS	\$ 1,810,223	\$ 1,040,070	\$ -		\$ -	\$ 2,850,293	\$ 2,850,293	\$ -



Lead-free Solder Body of Knowledge (Support to MSFC)

Description:

- Summarize lead-free test data (relative to space environments), analyze risks to NASA, and recommend mitigation strategies

Stakeholders:

- NASA-MSFC

Benefits:

- Will recommend future lead-free testing with technical justification included.
- Will identify risks to NASA of both the commercial lead-free transition and the possibility of converting to lead-free solder alloys.



FY 04 Achievements:

- Established numerous points of contact with regards to reliability studies. A table is being generated to track all of the POCs and resources being utilized for this effort.
- As of December 2004 the list contains 80 POCs among 67 organizations or companies of which 21 have already been contacted for a request of high-performance, high-reliability study information.

Future Plans:

- Continue to identify articles and studies that relate to LFS testing of high-performance electronics and make contact with companies or persons involved with those publications.
- Review the POCs and resources tracking table and follow-up by phone and email where deemed necessary.



Pb-free Solder BOK

Schedule

TASKS	FY04											
	1			2			3			4		
Develop SOW/Rwu w/Ctrs	■											
Issue RFP/contract							◆					
Review past testing							■	■	■	■		
Recommended plans							◆					
Risk mitigation strategy										◆		
Monitor ind./reg. Trends							■	■	■	■	■	■
Review current testing							■	■	■	■	■	
Publish TRO												◆

Project scheduled to complete June 2005



Lead-Free Solder Project “Phase 2”

Description:

- Follow-on project to the current JCAA/JG-PP LFS which completed in FY05, and the MSFC LFS Body of Knowledge.
- Objective is to address gaps in the current data and understanding of LFS

Stakeholders:

- TBD, but potential same as the current LFS project (NASA, Air Force, Army, Navy, Marines, Dept. of Energy, manufacturers and vendors)

Benefits:

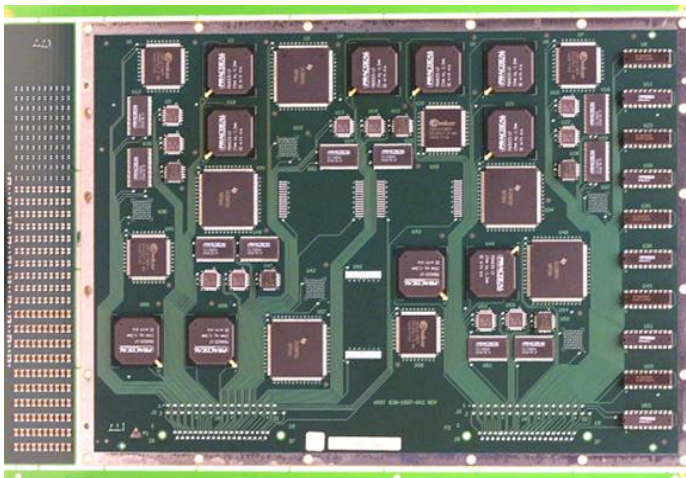
- Team already formed– same players → can begin developing scope of project immediately after current project ends
- Likelihood of in-kind contributions from OEMs

FY 04 Achievements:

- Have been soliciting ideas from team members on the current JCAA/JG-PP Lead-Free Solder project concerning possible LFS follow-on projects.

Future Plans:

- Select project idea and scope
- Identify nature and extent of team member intended contributions to the project
- Begin developing test plan
- **Address need for \$75K project “seed” money in FY05**





Lead-Free Solder “Phase 2” – Funding

DoD-NASA Lead Free Solder Phase 2

Reporting Date: December 31, 2004

Gov't Project Manager: TBD

Status: **Proposed (project in development)**

AP2 POC: Kurt Kessel, ITB

Project Initiation Date ###/##/##

(FY = AP2 FY - starts in April)

DIRECT FUNDING					
Source	Prior Years	FY 2004	FY 2005 POM	FY 2006 POM	Total Direct Funding
NASA AP2	\$ -	\$ -	\$ 75,000	\$ -	\$ 75,000
NASA Other	\$ -	\$ -	\$ -	\$ 100,000	\$ 100,000
Air Force	\$ -	\$ -	\$ 75,000	\$ 100,000	\$ 175,000
Army	\$ -	\$ -	\$ -	\$ -	\$ -
Marines	\$ -	\$ -	\$ -	\$ -	\$ -
Navy	\$ -	\$ -	\$ -	\$ 100,000	\$ 100,000
Other Gov't (e.g., ESTCP)	\$ -	\$ -	\$ -	\$ -	\$ -
Non-Gov't (e.g., OEMs)	\$ -	\$ -	\$ -	\$ 50,000	\$ 50,000
	\$ -	\$ -	\$ -	\$ -	\$ -
TOTALS	\$ -	\$ -	\$ 150,000	\$ 350,000	\$ 500,000

IN-KIND CONTRIBUTIONS						Total Budget
Source	Prior Years	FY 2004	FY 2005 POM	FY 2006 POM	Total In-Kind	
NASA AP2	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 75,000
NASA Other	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 100,000
Air Force	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 175,000
Army	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Marines	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Navy	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 100,000
Other Gov't (e.g., ESTCP)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Non-Gov't (e.g., OEMs)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 50,000
	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTALS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 500,000

EXPENDITURES	Prior Years	FY 2004	FY 2005	FY 2006	Total Rec'd	Spent+ Committed	Balance
NASA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Other Gov't Agencies	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
ITB	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Other Contractor	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Non-Gov't (e.g., OEMs)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Other	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTALS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Notes:

FY05 POP

\$75,000: "Seed" money for project initiation (buy materials), from NASA and AF

FY06 POP

\$100,000: NASA & AF funds to buy balance of materials and/or pay for testing

\$100,000: Navy funds to pay for testing

\$50,000: Misc. direct funds



Lead-Free Solder - Business case for communication/coordination across NASA

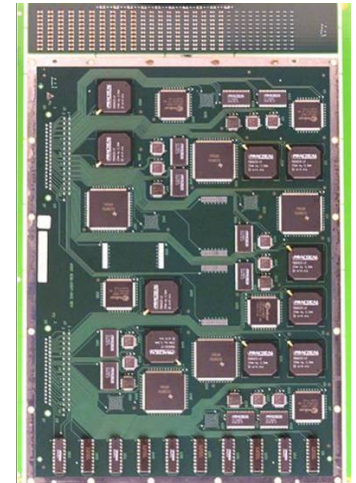
LFS Issues: As electronics manufacturers continue the transition to lead-free, NASA must fully understand the risks associated with lead-free solders in aerospace applications. NASA faces major challenges associated with lead-free including tin whisker formation, lead-free solder reliability and intermetallic contamination between lead and lead-free solder alloys created during rework procedures.

Problem: It is not clear how aware NASA Headquarters is of the issues and risks that LFS creates. The NASA AP2 Office was unable to confirm who within NASA Headquarters has been briefed on the issues. Currently there are two separate focus areas being addressed within NASA: tin whisker (GSFC) and LFS (MSFC).

AP2 Activities: The NASA AP2 Office has been in contact with GSFC, MSFC, and JPL to discuss the issues associated with LFS.

Proposed Solutions: An effort should be made to coordinate LFS work across NASA bringing the primary centers together. Once organized the following efforts need to be accomplished:

- Brief the Office of Chief Engineer
- Brief the 4 NASA Mission areas: Exploration Systems, Space Operations, Science and Aeronautics Research





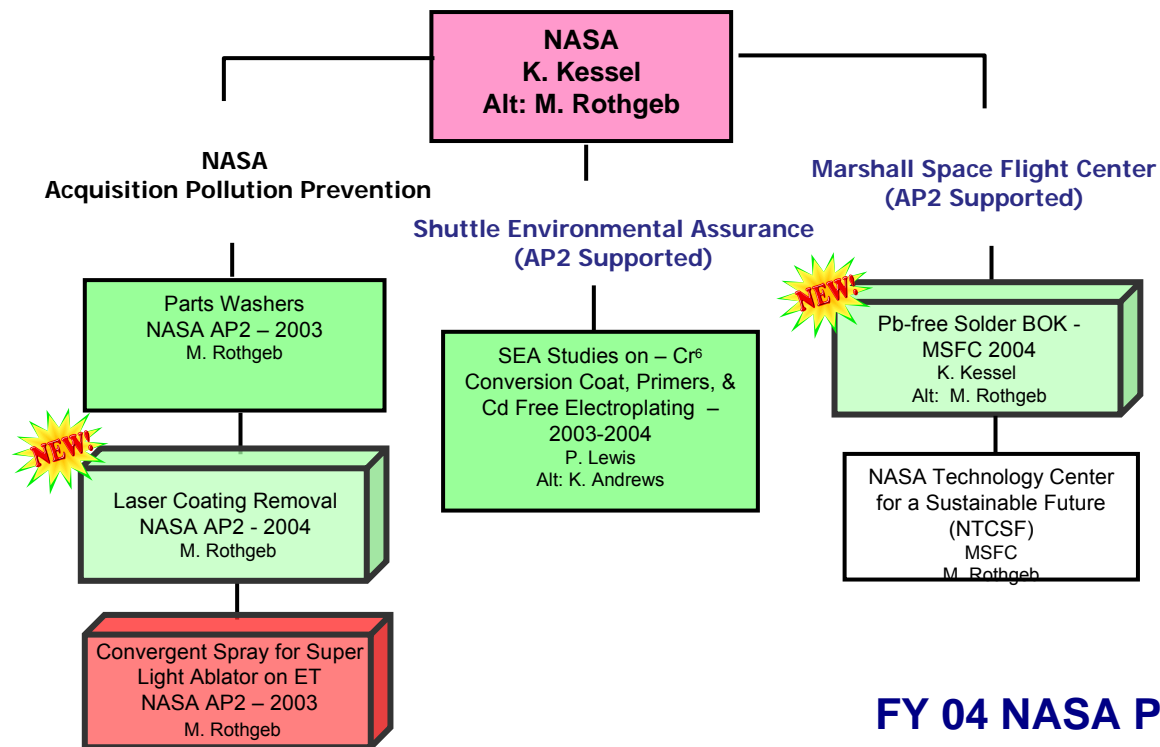
NASA Business Entity



NASA AP2

FY 2004 Agency Business Entity Projects and ITB POCs

- **Overall Objective:**
Encourage and lead joint P2 efforts to reduce hazardous materials across multiple Centers and Programs



- = active project
 - = developing project
 - = future consideration
 - = discontinued project activity/category
- 3D blocks = **change in status**

FY 04 NASA Projects Summary

Discontinued one project, but added two new projects, for a net increase of **one active** project



NASA Projects Review



NASA Portable Laser Coating Removal System (Technology Evaluation)

Description:

- Follow-on from JG-PP PLCRS project, to look at new application areas for use within NASA.
- Determined NASA's need for alternative method of stripping coatings on Shuttle and GSE

Stakeholders:

- NASA KSC (USA, Boeing) and GRC

Benefits:

- Follow-on from JG-PP project, so no duplication
- Decreased hazardous waste generation & cost
- Prevents contamination in tile-cavity stripping.



Courtesy: Quantel SA, France

Nd: YAG Laser



Courtesy: Laserline, Germany

Diode Laser

FY 04 Achievements:

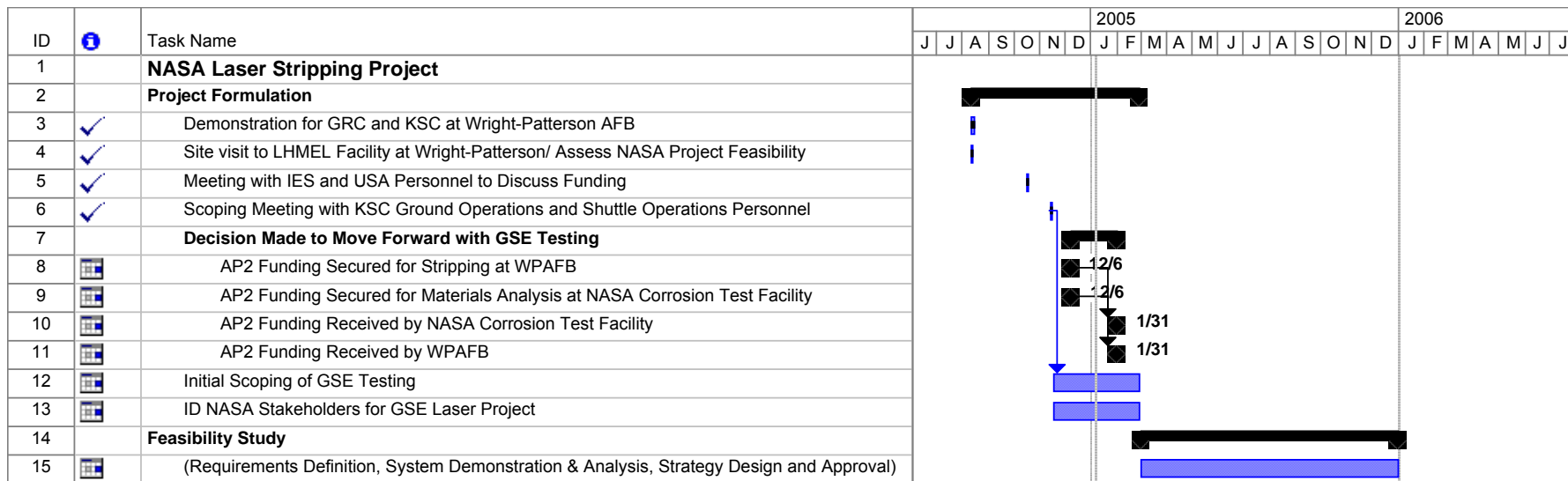
- Located stakeholders within OEM's, Contractors and NASA to move forward with a follow-on to the JG-PP PLCRS Project.
- Contingent of technical reps from KSC and GRC viewed demonstration of 3 portable laser systems at Wright-Patterson AFB (Aug. 2004)
- Submitted for IES funding of a Laser / Liquid Nitrogen Stripping Study
- Developing test protocols and requirements

Future Plans:

- **Address need for \$25K in FY05 for dem/val on Shuttle parts**
- Monitor request for \$300K IES FY05 funds
- Demonstrate / Validate for use on Shuttle tile-cavity and for use in GSE within NASA.
- Develop a Test Report and Implementation Plan for use of similar systems across NASA Centers for small-scale stripping applications.



NASA Portable Laser Coating Removal System – Schedule



To date, no detailed schedule of 2005 activities has been set by the team. As such, the schedule shown mostly highlights past project activity.



NASA Portable Laser Coating Removal System – Funding

NASA Portable Laser Coating Removal System

Reporting Date: December 31, 2004

Gov't Project Manager: {e.g., Chris Brown}

Status: Active

AP2 POC: Matt Rothgeb, ITB

Project Initiation Date ###/###

(FY = AP2 FY - starts in April)

Notes:

\$50,000 – AP2 FY04 funds for PLCRS dem/val on GSE using AFRL laser lab facilities to strip piece parts.

FY 05 POP

\$25,000 – AP2 funds desired for laboratory analysis of stripped parts at USTDC facility.

\$300,000 – IES funds desired for PLCRS dem/val on Shuttle parts

DIRECT FUNDING					
Source	Prior Years	FY 2004	FY 2005 POM	FY 2006 POM	Total Direct Funding
NASA AP2	\$ -	\$ 50,000	\$ 25,000	E \$ -	\$ 75,000
NASA Other	\$ -	\$ -	\$ 300,000	E \$ -	\$ 300,000
Air Force	\$ -	\$ -	\$ -	\$ -	\$ -
Army	\$ -	\$ -	\$ -	\$ -	\$ -
Marines	\$ -	\$ -	\$ -	\$ -	\$ -
Navy	\$ -	\$ -	\$ -	\$ -	\$ -
Other Gov't (e.g., ESTCP)	\$ -	\$ -	\$ -	\$ -	\$ -
Non-Gov't (e.g., OEMs)	\$ -	\$ -	\$ -	\$ -	\$ -
	\$ -	\$ -	\$ -	\$ -	\$ -
TOTALS	\$ -	\$ 50,000	\$ 325,000	\$ -	\$ 375,000

IN-KIND CONTRIBUTIONS						
Source	Prior Years	FY 2004	FY 2005 POM	FY 2006 POM	Total In-Kind	Total Budget
NASA AP2	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 75,000
NASA Other	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 300,000
Air Force	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Army	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Marines	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Navy	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Other Gov't (e.g., ESTCP)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Non-Gov't (e.g., OEMs)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTALS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 375,000

EXPENDITURES	Prior Years	FY 2004	FY 2005	FY 2006	Total Rec'd	Spent+ Committed	Balance
NASA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Other Gov't Agencies	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
ITB	\$ -	\$ 50,000	\$ -	\$ -	\$ 50,000	\$ 50,000	\$ -
Other Contractor	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Non-Gov't (e.g., OEMs)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Other	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTALS	\$ -	\$ 50,000	\$ -	\$ -	\$ 50,000	\$ 50,000	\$ -



Parts Washer Alternatives FY04

Description:

- AP2 office identified the need for environmentally preferable parts washers during PPONAs.
- Scope includes testing select parts washers that meet performance guidelines set by stakeholders and developing a 'Consumer's Guide'.
- Will include comparative analysis of current parts washers used at NASA Facilities.

Stakeholders:

- KSC, MSFC, MAF, WFF, GRC, LaRC, JPL, SSC, WSTF, GSFC and ARC.



Benefits:

- Reduced costs associated with Hazardous Materials and Waste handling.
- Eliminate or reduce the EHS footprint of this process throughout NASA Centers.
- Cleaning efficiency tests add 10 weeks to schedule, but gain more quantitative evaluation
- Stakeholders now see benefit of collaborative projects

FY 04 Achievements:

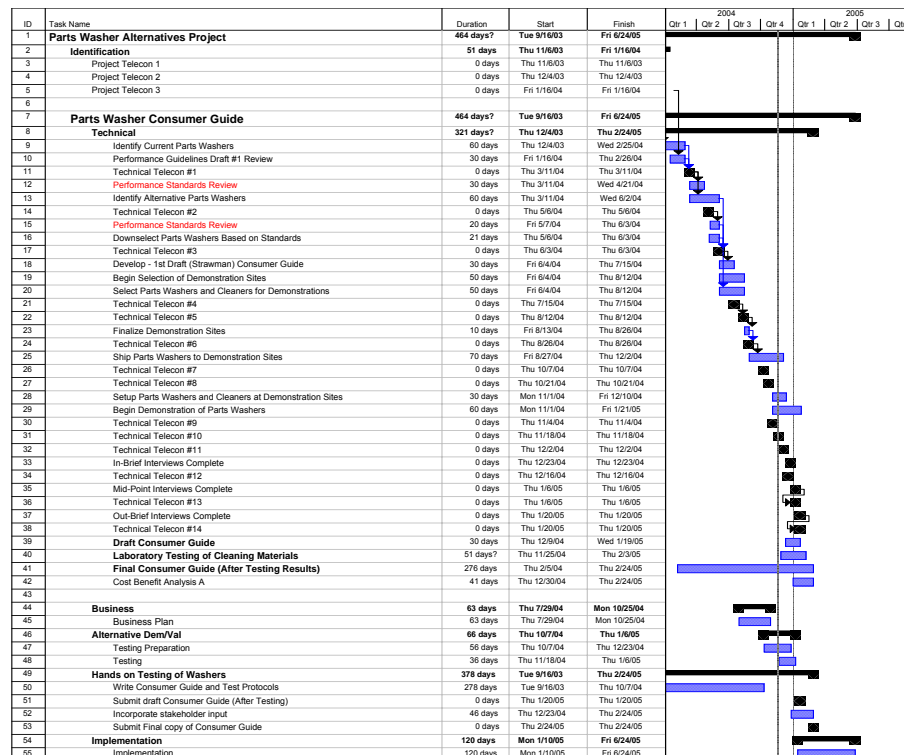
- Determined the deliverable most desired for stakeholders is a 'Consumer's Guide'.
- Surveyed Centers on current parts washers usage
- Began development of performance guidelines and benchmarks that will be covered in the guide.

Future Plans:

- Demonstrate parts washers at four NASA Centers
- Conduct testing at Rochester Inst. Techn.
- Prepare report in the form of a guidance document for selecting alternative parts washers



Parts Washer Alternatives – Schedule



The overall schedule for this project has slipped by four weeks, primarily due to Hurricanes Francis, Ivan, and Jeanne in the August, 25 - September 27 timeframe. The hurricanes resulted in cancelled teleconferences and shifted the parts washer demonstrations into the Holiday Season and gathering data from the test units has been difficult due to lack of ongoing work at the facilities. It is hoped that it will still allow for the publishing of the initial technical document before the end of January 2005. Because of funding schedules, the laboratory testing will not be completed until early March, when it will be included in the guidebook for final distribution. This updated schedule reflects these changes.



Parts Washer Alternatives – Funding

NASA Parts Washer

Reporting Date: December 31, 2004

Gov't Project Manager: {e.g., Chris Brown}

Status: Active

AP2 POC: Matt Rothgeb, ITB

Project Initiation Date ####

(FY = AP2 FY - starts in April)

DIRECT FUNDING					
Source	Prior Years	FY 2004	FY 2005 POM	FY 2006 POM	Total Direct Funding
NASA AP2	\$ -	\$ 25,000	\$ -	\$ -	\$ 25,000
NASA Other	\$ -	\$ -	\$ -	\$ -	\$ -
Air Force	\$ -	\$ -	\$ -	\$ -	\$ -
Army	\$ -	\$ -	\$ -	\$ -	\$ -
Marines	\$ -	\$ -	\$ -	\$ -	\$ -
Navy	\$ -	\$ -	\$ -	\$ -	\$ -
Other Gov't (e.g., ESTCP)	\$ -	\$ -	\$ -	\$ -	\$ -
Non-Gov't (e.g., OEMs)	\$ -	\$ 5,000	\$ -	\$ -	\$ 5,000
	\$ -	\$ -	\$ -	\$ -	\$ -
TOTALS	\$ -	\$ 30,000	\$ -	\$ -	\$ 30,000

IN-KIND CONTRIBUTIONS						
Source	Prior Years	FY 2004	FY 2005 POM	FY 2006 POM	Total In-Kind	Total Budget
NASA AP2	\$ -	\$ 15,000	\$ -	\$ -	\$ 15,000	\$ 40,000
NASA Other	\$ -	\$ 5,000	\$ -	\$ -	\$ 5,000	\$ 5,000
Air Force	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Army	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Marines	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Navy	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Other Gov't (e.g., ESTCP)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Non-Gov't (e.g., OEMs)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 5,000
	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTALS	\$ -	\$ 20,000	\$ -	\$ -	\$ 20,000	\$ 50,000

EXPENDITURES	Prior Years	FY 2004	FY 2005	FY 2006	Total Rec'd	Spent+ Committed	Balance
NASA	\$ -	\$ 5,000	\$ -	\$ -	\$ 5,000	\$ 5,000	\$ -
Other Gov't Agencies	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
ITB	\$ -	\$ 40,000	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ -
Other Contractor	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Non-Gov't (e.g., OEMs)	\$ -	\$ 5,000	\$ -	\$ -	\$ 5,000	\$ 5,000	\$ -
Other	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTALS	\$ -	\$ 50,000	\$ -	\$ -	\$ 50,000	\$ 50,000	\$ -

Notes:

\$25,000: NASA AP2 FY04 funds for core testing requirements

\$15,000: AP2 FY04 in-kind labor (to date)

\$5,000: NASA stakeholder in-kind labor (to date)

\$40,000: ITB FY04 subcontracted testing costs + in-kind labor (to date)



Convergent Spray Technology (discontinued)

Description:

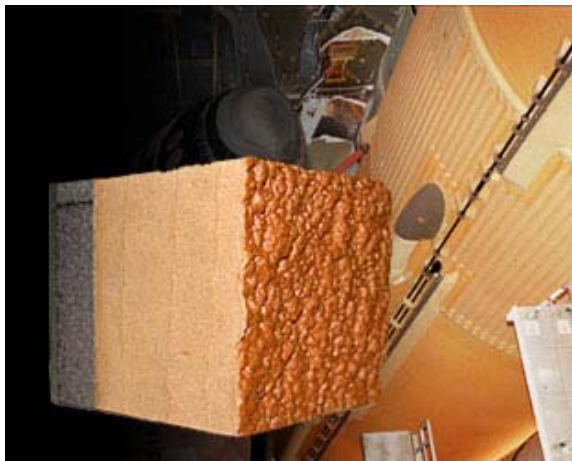
- Goal is a migration of CST technology to Michoud ET ablator application operations
- Currently SRBs are using the system for a similar process.
- Will reduce cost of process and increase safety.

Benefits:

- CST will eliminate thousands of gallons of MEK and other solvents for each External Tank processed.
- Decreased cost of operation with less procurement of hazardous materials.

Stakeholders:

- Kennedy Space Center, Marshall Space Center, Michoud Assembly Facility.
- United Space Alliance, Lockheed Martin



FY 04 Achievements:

- Held three quarterly teleconferences, identified key stakeholders and benefits.
- Began collecting data necessary to build JTP and test plans.

Future Plans:

- None. Due to NASA Return To Flight priorities and decrease in life span of Shuttle system, project was discontinued.
- Should some TPS be used on future NASA aerospace vehicles, CST would be re-examined.



AP2-Supported Agency Projects



SEA Collaborative Studies

Three (3) technical areas of support:

- 1. Replacement for Hexavalent Chromium Conversion Coatings**
- 2. Replacement for Hexavalent Chromium Primers**
- 3.  Replacement for Cadmium Plating (New in FY 04)**

FY04 Achievements

- AP2 Office conducted a survey of Outside Agency work in this area and presented this information to the SEA group at Face-to-Face Meetings
- Submitted summary charts regarding Outside Agency work for the final report
- Prepared written descriptions of potential alternative technologies for SEA use
- AP2 Office will lead migration efforts of any approved alternatives to other NASA programs
- SEA Peer Award given to Ms. Pattie Lewis, ITB



NASA Technology Center for a Sustainable Future (NTCSF) (Support to MSFC)

Description:

- A Draft RFP was discussed at the NASA Environmental & Energy Conference in May, 2004.
- The RFP purpose is to solicit proposals for a NASA Center for Sustainable Development.
- Many of the goals of this proposed Center for Sustainable Development mirror or are similar to the objectives and efforts that the NASA AP2 Office is familiar with.



Benefits:

- Reduce effort within NASA for P2 and Sustainability Programs and Projects.
- Begin shifting NASA to a Sustainability mindset for processes, missions and procurement.

FY 04 Achievements:

- Met with MSFC personnel to discuss the possibility of teaming with them in the proposal process.
- Identified outside partners (Universities and Technical Bodies) as required by the RFP
- Identified parallel activities between the proposed Center for Sustainability and MSFC / KSC operations.
- Began assembly of information for inclusion in the RFP (No Final RFP has been released by NASA HQ)

Future Plans:

- Continue to work with MSFC on this effort.
- When final RFP is announced begin formal planning and creation of the RFP from MSFC/KSC.



International Business Entity



International Support Activities

- **Overall Objective:** Provide support to the C3P in accordance with the tenets of the Joint Statement (JS) between NASA and the Portuguese Ministry of the Environment Regarding Cooperation in the Field of Environmental Pollution Prevention.
- **Functional Categories**
 - In accordance with the JS, the NASA AP2 Program supported C3P in:
 - C3P program development
 - Support and monitor active C3P projects
 - Identify P2 needs and develop projects
 - Train C3P engineer



2004 NASA-C3P JOG and P2 Workshop

Week of September 20, 2004

• C3P Joint Oversight Group Meeting:

- At KSC Beach House
- Attended by all C3P core members (ISQ, INEGI, ITB), HQ NASA, NASA AP2, and NASA CD
- Concluded with VIP tour of KSC
- Report submitted to Portuguese Minister of Environment & U.S. Ambassador to Portugal.

• P2 Workshop:

- At Radisson Resort (2 days)
- 114 total attendees
 - ♦ 40 local + 74 visiting; 30 speakers
- Countries represented: United States, Portugal (10), United Kingdom (2), Turkey (1), Canada (1), The Netherlands (1)
- Met workshop objectives (see next slide)





2004 NASA-C3P P2 Workshop

• Identifying New Joint Opportunities: Objective & Outcomes

- Garnered interest from KSC (JBOSC), Wallops, & C3P on a project opportunity to evaluate membrane technology for removing VOCs from process air streams
- European Space Agency indicated interest in an information exchange with NASA AP2 on nonchrome pretreatments
- Fostering a lead-free solder test information exchange between NASA (JG-PP LFS project) and Hereaus (an international solder manufacturer)
- Received 3-page proposal from BAE Systems (NY) to consider jointly develop a draft standard to show parts manufacturers how to mark parts lead-free in a common manner
- LFS stakeholder interest in idea of a LFS summit with a major Navy electronics program in 2005
- Received offers of tentative and confirmed in-kind contributions for follow-on LFS project.
- Interest from AFSPC, Hill AFB, Patrick AFB, and NASA in a coatings system project.



2005 NASA-C3P JOG and P2 Workshop

- Location: Lisbon & Algarve, Portugal
- C3P to coordinate Workshop
 - Day 1 (Lisbon) – Technical Journey
 - Morning session
 - Keynote speaker: Roy Bridges
 - Afternoon session
 - Day 2 – C3P Workshop
 - Afternoon session (only)
 - Day 3 – C3P Workshop
 - All day sessions
- JOG to be held in conjunction
- **NASA AP2 Recommendations:**
 - Before workshop, C3P inquire of prospective stakeholders their top P2 needs
 - At the workshop, prospective stakeholders participate in a roundtable discussion of ideas for possible collaborative P2 projects
 - NASA AP2 host another P2 workshop in 2006 (i.e., every 2 years)?





International Projects Review

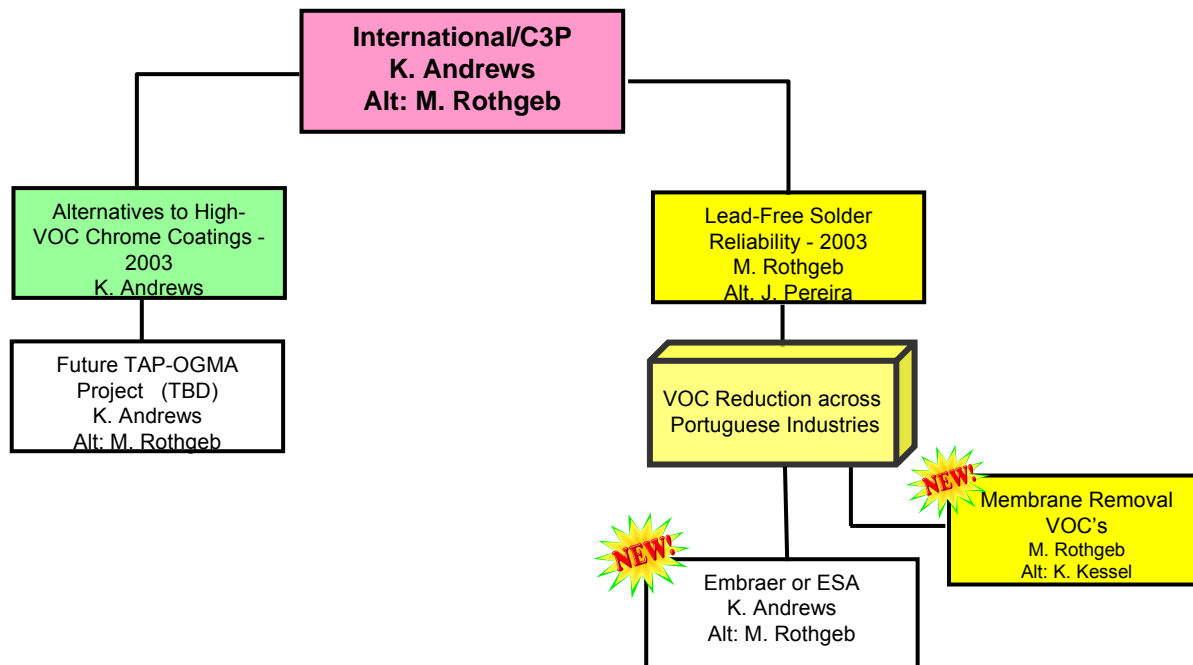


NASA AP2

FY 2004 International Business Entity Projects and ITB POCs

FY 04 International- NASA Projects Summary

TAP-OGMA coatings project
remains the one active C3P
project.



- = active project
- = developing project
- = future consideration

3D blocks = **change in status**



Alternatives to High-VOC/Chrome-containing Coatings for Commercial Aircraft Exteriors

Objective: Demonstrate low-VOC and non-chrome coatings (pretreatment-primer-topcoat) on Portuguese commercial aircraft

Justification: The identification/qualification of hex-chrome free coating systems is a Portuguese priority due to national & European safety and environmental regulations.

Accomplishments:

- Team formed: TAP Air Portugal, OGMA
- Indústria Aeronáutica de Portugal, C3P & NASA AP2
- Technical requirements and test plan formulated
- Painted exterior service door of a TAP Airbus A319 and dip-applied non-chrome pretreatment on several panels (Oct. 2004) (see next slide).





Alternatives to High-VOC/Chrome-containing Coatings for Commercial Aircraft Exteriors

Coating system application (spray)

Two coating systems were applied to the door of an Airbus A319 in the following manner

- **Upper half:** High Solids AZCO NOBEL painting scheme:

 - M790E, for surface preparation**

 - Aviox CF Primer

 - Aviox Finish 77702

- **Lower Half:** Pantheon Chemical Conversion Coating
+ High Solids AZCO NOBEL painting scheme:

 - PreKote Chemical Pretreatment**

 - Aviox CF Primer

 - Aviox Finish 77702

Coating system application (dip)

The project team also conducted dip application testing (plating shop) at TAP's facility. The intention here was to assess the processing requirements of the PreKote system, as well as to prepare some test panels for laboratory testing (e.g. filiform and salt spray corrosion testing)



PreKote scrubdown and foaming

Future actions:

Application and flight testing of the PreKote aluminum pretreatment on a military aircraft is anticipated in the first quarter of 2005 under the auspices of the Portuguese Air Force. The availability of a PoAF C130 or F16 is currently under review.



TAP/OGMA PreKote – Aviox System Test Matrix

	Test	Test Method	Capability	Commitment to Test ^a
1	Gloss	ISO 2813	ISQ, TAP, OGMA, NASA	
2	Initial Color	ISO 7724 5.3	ISQ, TAP, OGMA, NASA	
3	Adhesion – Cross Hatch	ISO 2409	ISQ, TAP, OGMA, INEGI, NASA	
4	Impact (reverse)	ISO 6272	ISQ, NASA	
5	Flexibility – Conical Mandrel	ISO 6860	ISQ, INEGI, NASA	
6	Flexibility – Cylindrical Mandrel	ISO 1519	ISQ, NASA	
7	Water a) Blistering b) Grade c) Penetration	ISO 4628.5 ISO 2409 ISO 1518	ISQ, INEGI, NASA	
8	Fluid Resitance – Hydraulic fluid Skydrol LD4, Hyjet IV-A or equivalent	ISO 1518	ISQ, NASA	
9	Corrosion Resistance - Filliform	EN 3665 1000 hrs	ISQ, NASA	
10	Corrosion Resistance – Salt Spray	ISO 7253 3000 hrs	ISQ, OGMA, INEGI, NASA	
11	Artificial weathering	ISO 2813, ISO 7724	ISQ, NASA	
12	Washability (cleaning efficiency)	ISO 2813	ISQ, NASA	
13	Strippability	AMS 3095 5.4	ISQ, TAP, OGMA, NASA	
14	Restoration	AMS 3095 5.5	ISQ, NASA	
15	Heat Stability	ISO 1519, ISO 3270	ISQ, NASA	

^a Awaiting word from C3P partners on their intent to perform any of these tests as in-kind contributions



Lead-Free Solder Reliability

Objective: Design “green electronics” testing program that will complement JG-PP and other European lead-free testing programs. Such a project would address the impact of the following parameters on reliability:

- Solder alloy
- Board finish
- Components
- Tests and testing conditions

Status:

- ISQ looking into linking the following EU LFS projects to C3P:
- LEADOUT, a TWI lead-free solder effort
- ELFNET, a consortia of 100 European companies

Future Plans:

- Recommend C3P/ISQ explore lead-free needs of current associates, such as BAE Systems, ANIMEE, and HDPUG-GECI.
- SetCom Electrónica, Portugal (an electronics manufacturer; interest in lead-free solder) plans to sign a C3P exchange protocol



VOC Reduction across Portuguese Industries

Objective: Identify, test and validate low-VOC materials for commercial and industrial process in Portugal. This project is in support of EU DIRECTIVE 1999/13/CE (and subsequent Portugal law DL n°242/2001) to reduce both the direct and indirect effects of VOC emissions to human health.

Status:

- The C3P project submission was not viewed favorably by the approving authority
- NASA AP2 identified the following VOC reduction opportunities/ stakeholders
 1. Reduction of VOCs in Portuguese automotive industry (CaetanoBus, Salvador Caetano, Citroen Lusitania) using low-VOC paints/ cleaners/ strippers or in-process controls (e.g., membrane filtration)
 2. Reduction of VOCs in Portuguese printing industry (AMCOR Flexibles, Lisgrafica) using low-VOC inks & dyes or in-process controls (e.g., membrane filtration)

Future Plans:

- The C3P project submission was not viewed favorably by the approving authority, as such, all efforts by the NASA AP2 Program and ITB to support this activity has been discontinued.



Removal of VOCs from Air Streams using Membrane Technologies (Project Opportunity)

Proposed Objective: Demonstrate the feasibility of a membrane unit for removing VOCs from one or more contaminated process air streams (e.g., remediation, paint booth, solvent cleaning, metal finishing, solvent recycling)

Justification: Technology is near to COTS stage, very new and promising for several types of air contaminants.

History:

- Prototype membrane technology demonstrated on paint booth at KSC
- Presentation at NASA AP2 Sep. 2004 Int'l P2 Workshop garnered interest from technical reps from NASA (KSC, Wallops, MSFC, GRC, Plumbrook, MAF) & C3P

Future Plans:

- NASA AP2 develop project scope
 - ◆ Air streams & contaminants
 - ◆ Performance requirements
 - ◆ Stakeholders





Membrane for VOC Removal – Funding

VOC Removal from Process Air Streams

Reporting Date: December 31, 2004

Gov't Project Manager: {e.g., Chris Brown}

Status: Active

AP2 POC: {Your name}, ITB

Project Initiation Date ###/###

(FY = AP2 FY - starts in April)

Notes:

- \$12,993: Associated costs with previous testing at KSC Corrosion Control Facility (2001).

FY05 POP

- \$25,000: AP2 FY05 "seed" money
- \$50,000: From SGS or other NASA stakeholders, for prototyping a mobile demo unit
- \$50,000: From C3P source
- \$2,000: ITB labor (to date)

DIRECT FUNDING						
Source	Prior Years	FY 2004	FY 2005 POM		FY 2006 POM	Total Direct Funding
NASA AP2	\$ -	\$ -	\$ 25,000	E	\$ -	\$ 25,000
NASA Other	\$ 12,993	\$ -	\$ 50,000	E	\$ -	\$ 62,993
Air Force	\$ -	\$ -	\$ -		\$ -	\$ -
Army	\$ -	\$ -	\$ -		\$ -	\$ -
Marines	\$ -	\$ -	\$ -		\$ -	\$ -
Navy	\$ -	\$ -	\$ -		\$ -	\$ -
Other Gov't (e.g., ESTCP)	\$ -	\$ -	\$ -		\$ -	\$ -
Non-Gov't (e.g., OEMs)	\$ -	\$ -	\$ 50,000	E	\$ -	\$ 50,000
	\$ -	\$ -	\$ -		\$ -	\$ -
TOTALS	\$ 12,993	\$ -	\$ 125,000		\$ -	\$ 137,993

IN-KIND CONTRIBUTIONS							
Source	Prior Years	FY 2004	FY 2005 POM		FY 2006 POM	Total In-Kind	Total Budget
NASA AP2	\$ -	\$ 2,000	\$ -		\$ -	\$ 2,000	\$ 27,000
NASA Other	\$ -	\$ -	\$ -		\$ -	\$ -	\$ 62,993
Air Force	\$ -	\$ -	\$ -		\$ -	\$ -	\$ -
Army	\$ -	\$ -	\$ -		\$ -	\$ -	\$ -
Marines	\$ -	\$ -	\$ -		\$ -	\$ -	\$ -
Navy	\$ -	\$ -	\$ -		\$ -	\$ -	\$ -
Other Gov't (e.g., ESTCP)	\$ -	\$ -	\$ -		\$ -	\$ -	\$ -
Non-Gov't (e.g., OEMs)	\$ -	\$ -	\$ -		\$ -	\$ -	\$ 50,000
	\$ -	\$ -	\$ -		\$ -	\$ -	\$ -
TOTALS	\$ -	\$ 2,000	\$ -		\$ -	\$ 2,000	\$ 139,993

EXPENDITURES	Prior Years	FY 2004	FY 2005		FY 2006	Total Rec'd	Spent+ Committed	Balance
NASA	\$ 12,993	\$ -	\$ -		\$ -	\$ 12,993	\$ 12,993	\$ -
Other Gov't Agencies	\$ -	\$ -	\$ -		\$ -	\$ -	\$ -	\$ -
ITB	\$ -	\$ 2,000	\$ -		\$ -	\$ 2,000	\$ 2,000	\$ -
Other Contractor	\$ -	\$ -	\$ -		\$ -	\$ -	\$ -	\$ -
Non-Gov't (e.g., OEMs)	\$ -	\$ -	\$ -		\$ -	\$ -	\$ -	\$ -
Other	\$ -	\$ -	\$ -		\$ -	\$ -	\$ -	\$ -
	\$ -	\$ -	\$ -		\$ -	\$ -	\$ -	\$ -
TOTALS	\$ 12,993	\$ 2,000	\$ -		\$ -	\$ 14,993	\$ 14,993	\$ -



C3P Support

- **Goal: Identify C3P P2 needs and develop C3P projects**
 - NASA AP2, ISQ, and INEGI independently identified 15 possible technical areas to pursue 2005 C3P projects, but none of the areas overlap.

Proposed FY 05 Plan

- C3P, with AP2 support, should contact prospective stakeholders in Portugal who are likely to share similar P2 needs and confirm their interest in collaborating on a joint project and donating some of their engineers time to help kick start a project:
 - Contact Portuguese construction/ transportation industry about metallization & other coatings for bridges & other steel structures
 - Contact CaetanoBus, Salvador Caetano, Citroen Lusitania, and other Portuguese auto manufacturers about evaluating low-VOC paints/ cleaners/ strippers or in-process controls (e.g., membrane filtration)
 - Contact AMCOR Flexibles, Lisgrafica, and other Portuguese printers about evaluating low-VOC inks & dyes or in-process controls (e.g., membrane filtration)
 - Contact Embraer
 - Contact ESA



C3P Support

C3P Program Development

- C3P should seek more involvement and project ideas from current members

Current signatories to C3P protocol	Involved in C3P project?	Pending signatories to C3P protocol
<ul style="list-style-type: none">• National Association of Electric and Electronic Manufactures (ANIMEE), Portugal• TAP Air, Portugal• OGMA – Aeronautical Industry of Portugal• BAE, U.K.• Portuguese AF	<p>N</p> <p>Y</p> <p>Y</p> <p>N</p> <p>Y</p>	<ul style="list-style-type: none">• INASMET, Spain (LF solder interest; testing lab)• SetCom, Portugal (LF solder interest)



C3P Support

- **Goal: Train C3P Engineer**

Ms. Joana Vide Pereira continued to act as the liason between the NASA AP2 Program and C3P (and it's stakeholder's). In this capacity she has received training in the following:

- Project Planning
- Project life cycle management
- Specification Writing
- Aerospace Coating qualification procedures
- Technical analysis of coatings and paints
- Technical report writing

Benefits

AP2 training provided to Ms. Vide Pereira is intended to support and improve the quality of her contribution to C3P and NASA AP2 initiatives.

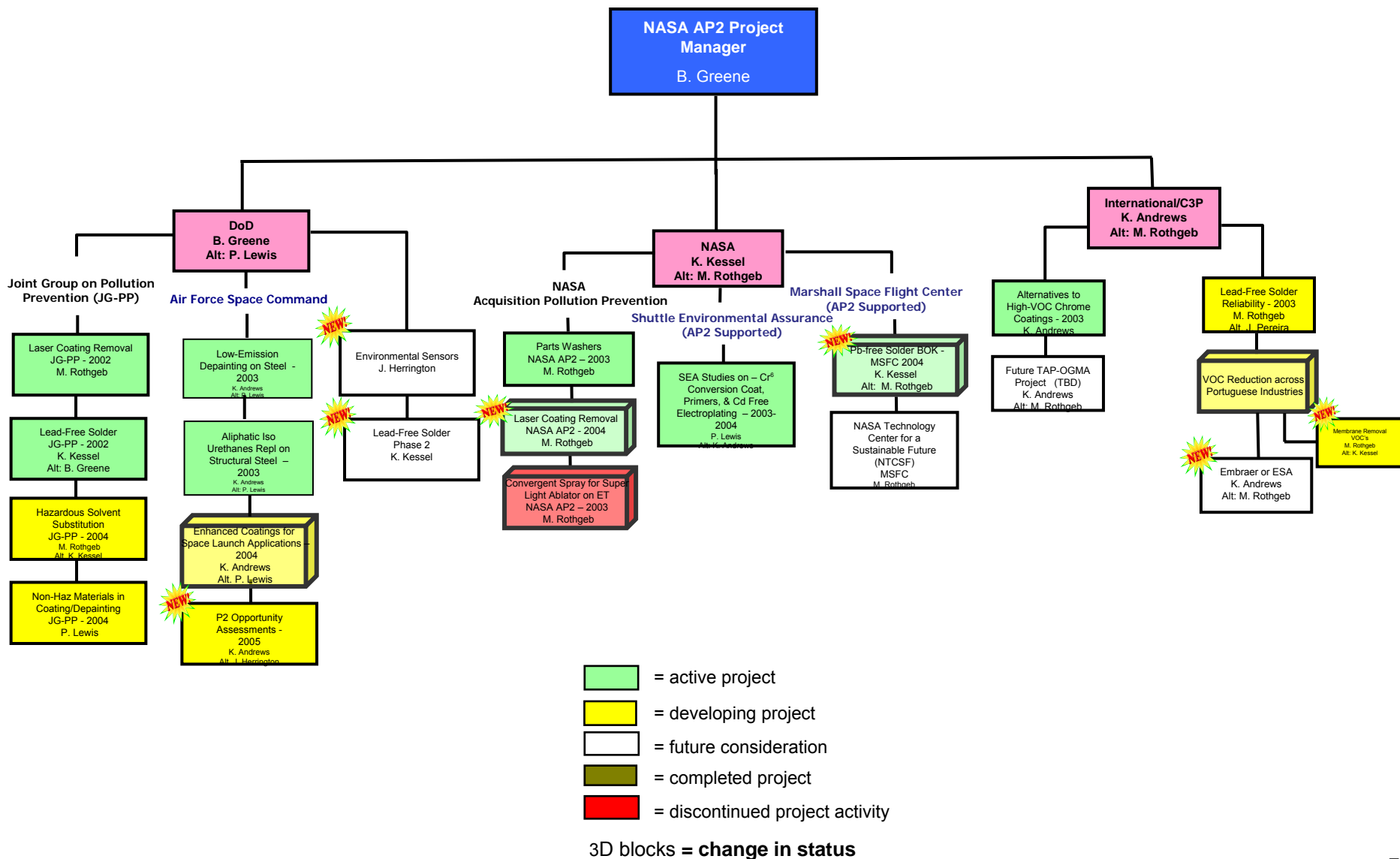
Proposed FY 05 Plan

Continue monitoring Ms. Pereira and providing regular guidance to her



NASA AP2

FY 2004 Agency, DoD, and International Business Entity Projects and ITB POCs





Forecasted FY 05 Projects

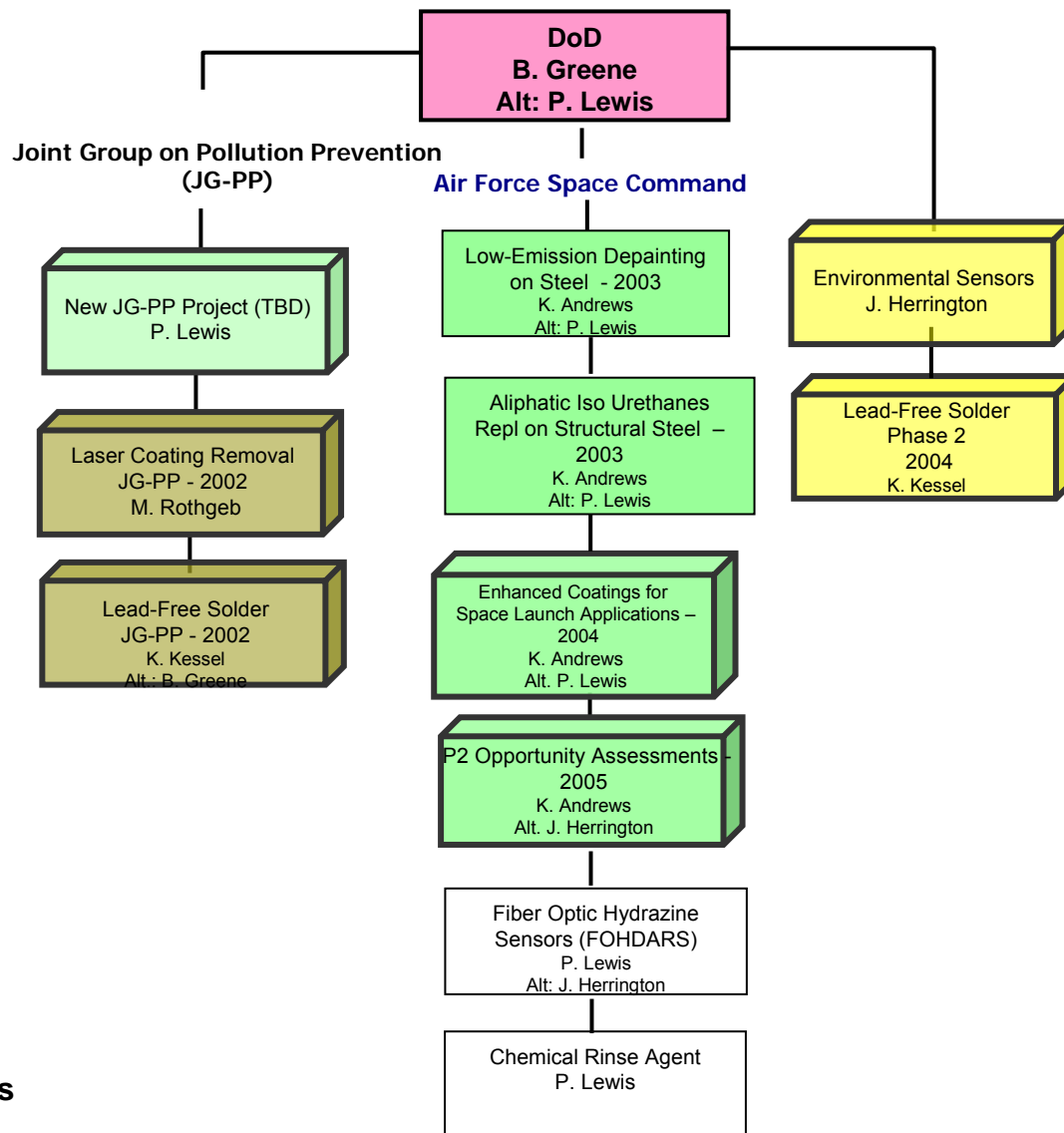


NASA AP2

FY 2005 DoD Business Entity Projects and ITB POCs

FY 05 DoD-NASA Projects Forecast

Two projects will complete
(JG-PP PLCRS & LFS) and
three projects will become
active (JG-PP (TBD),
AFSPC Coating, and
AFSPC PPOA)



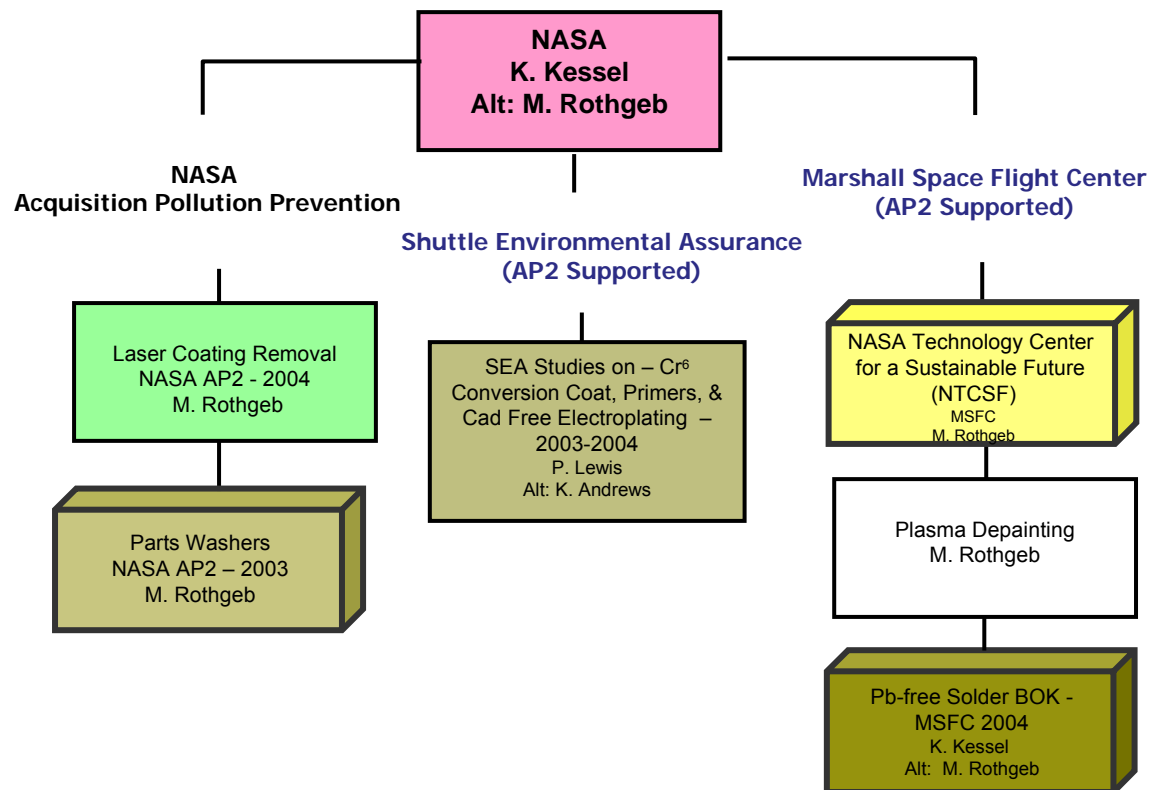


NASA AP2

FY 2005 Agency Business Entity Projects and ITB POCs

FY 05 NASA Projects Forecast

Three efforts will complete
(Parts Washer, SEA
Studies, & LFS BOK).
Scope of Laser Coating
Removal project could
expand depending on
funding.



- = active project
- = developing project
- = future consideration
- = complete project in FY 05
- 3D blocks = **change in status**

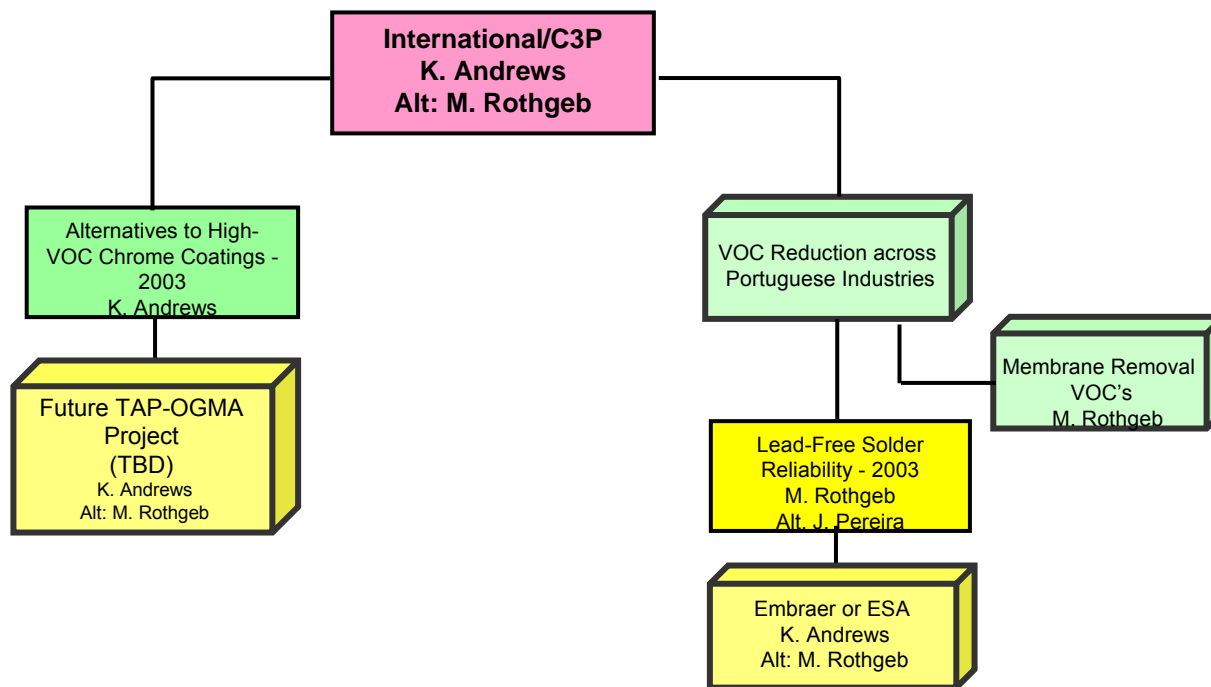


NASA AP2

FY 2005 International Business Entity Projects and ITB POCs

FY 05 International- NASA Projects Forecast

Anticipate one newly active
project, possibly in the area
of VOC reduction



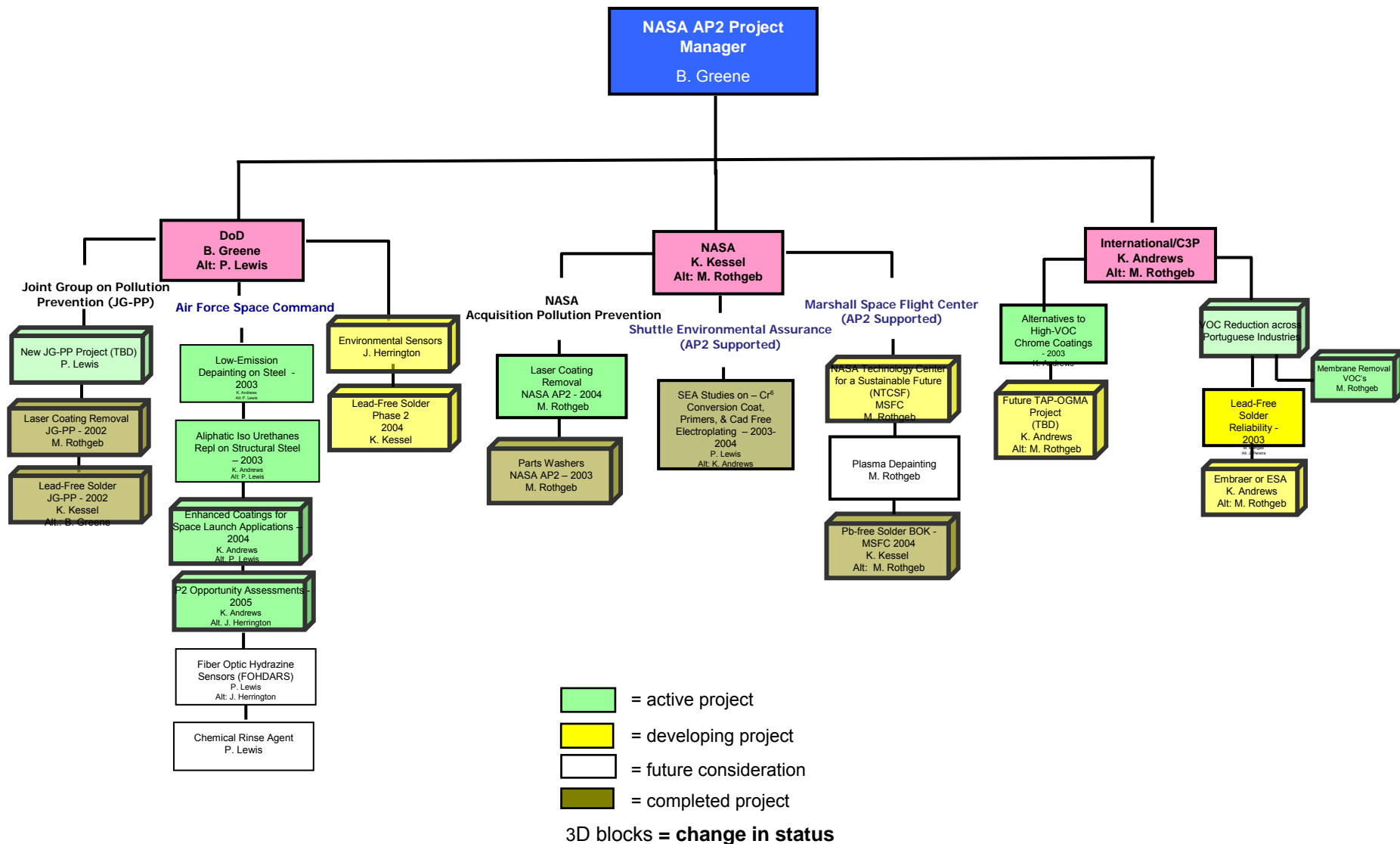
- = active project
- = developing project
- = future consideration

3D blocks = **change in status**



NASA AP2

FY 2005 Agency, DoD, and International Business Entity Projects and ITB POCs





Business Analysis



AP2 IDIQ Contract

as of 1/27/05

\$3M (FY03-start) IDIQ Contract

NAS10-03029/	Task Order #	Description	Status	Start	End	Budget	Total Committed	Total Funded To Date	Total Possible Funded
CC-90779B	1	AP2 FY03 Core	C	04/17/03	04/16/04	921,659.80	921,659.80	921,659.80	921,659.80
CC-90811B	2	C3P FY03 Core	C	07/17/03	07/16/04	75,000.00	75,000.00	75,000.00	75,000.00
CC-91738B	3	LFS Test Support	O	09/19/03	09/30/06	343,565.96	343,565.96	343,565.96	343,565.96
NNK04MA24D	4	MSFC FY04	C	10/31/03	10/30/04	141,925.46	141,925.46	141,925.46	141,925.46
NNK04MA80D	5	C3P FY04 Core	O	05/04/04	05/04/05	75,000.00	75,000.00	75,000.00	75,000.00
NNK04MA98D	6	AP2 FY04 Core	O	05/19/04	05/19/05	963,624.20	963,624.20	963,624.20	963,624.20
	7	MSFC FY05	O			498,794.58	498,794.58	149,883.60	149,883.60
	8	FY04 Parts Washer Testing	O			25,000.00	25,000.00	25,000.00	25,000.00
		AFSCP PPOA *	P			47,000.00		-	47,000.00
		Aging Aircraft LFS CET *	P			78,960.00		-	78,960.00
		Aging Aircraft LFS Hybrids *	P			134,420.00		-	134,420.00
								-	-
Sum Total						3,304,950.00	3,044,570.00	2,695,659.02	2,956,039.02
Contract IDIQ Max						3,000,000.00	3,000,000.00	3,000,000.00	3,000,000.00
Balance						(304,950.00)	(44,570.00)	304,340.98	43,960.98

* Budget estimate. Assumes 6% NASA fee on MIPRs

C = Closed

O = Open

P = Pending



AP2 Projects FY 05 Funding Plan

Source	FY 2005 Unfunded Requirements		FY 2005 Emerging Opportunities		Total Direct Funding Need
NASA AP2	\$ 125,000	- \$125K: Isocyanate Urethane Coatings Replacements dem/val	\$ 125,000	- \$75K: Lead-Free Solder follow-on parts - \$25K: NASA PLCRS dem/val on Shuttle parts - \$25K: C3P Membrane Removal of VOCs dem/val	\$ 250,000
NASA Other	\$ 40,000	- \$20K: Low-Emission Depainting dem/val - \$20K: Isocyanate Urethane Coatings Replacements	\$ 355,000	- \$5K: Coatings (Kimetsan) for Space Launch Applications - \$300K: IES FY05 funding for PLCRS dem/val on Shuttle parts - \$50K: C3P Membrane Removal of VOCs dem/val	\$ 395,000
Air Force	\$ 110,000	- \$110K: AFSPC, for Isocyanate Urethane Coatings Replacements dem/val	\$ 147,000	- \$22K: AFSPC, for Coatings (Kimetsan) for Space Launch Applications - \$75L: AF, for Lead-Free Solder follow-on - \$50K: AFSPC, for P2 Opportunity Assessments	\$ 257,000
C3P/ Portugese stakeholder			\$ 50,000	- \$50K: C3P Membrane Removal of VOCs dem/val	\$ 50,000
TOTALS	\$ 275,000		\$ 677,000		\$ 952,000



Opportunities & Risks



Opportunities & Risks

- Solidify and promote the relationship between AP2 – Agency P2 Strategy
- NASA should consider participation on ESTCP Board.
- Discontinuance of NASA fiscal support to C3P Program/Project development may threaten the efforts.
- As Shuttle program fades, need to transition AP2 into newer, ongoing programs, such as CEV and ELV
- Planned NASA Technical Center for a Sustainable Future will overlap many NASA AP2 functions



Contact Information

NASA AP2 Website:

<http://www.acqp2.nasa.gov/>



Ms. Christina M. Brown

AP2 Program Manager and Principal Center Manager

NASA JG-PP Working Group Representative

Phone: (321) 867-8463

E-Mail: Christina.M.Brown@nasa.gov



NASA AP2 Personnel



AP2 Contractor Support

• 2004 Personnel

- ITB Program Manager – Brian Greene
- Program Analyst/Coordinator – Katherine Torres
- Principal Senior Engineer – Kevin Andrews
- Web/Database & Admin. Specialist – Cassandra Carroll
- Sr. Engineer – Kurt Kessel
- Engineers – Matt Rothgeb, Pattie Lewis, John Herrington





NASA AP2 Personnel



Christina M. Brown
NASA Pollution Prevention
Program Manager and
Principal Center Manager

Brian Greene
ITB Program Manager

Katherine B. Torres
Program Analyst/Coordinator

Cassandra Carroll
Web/Database & Admin
Specialist

Kevin Andrews
Principal Senior Engineer

Kurt Kessel
Senior Engineer

Matt Rothgeb
Engineer

Pattie Lewis
Engineer

John Herrington
Engineer



NASA AP2 Profiles

Brian Greene



ITB Program Manager

Address: ITB Southern Office
2460 N. Courtenay Pkwy Ste. 101
Merritt Island, FL 32953

Tel: (321) 453-3838
Fax: (321) 453-3224
E-mail: greeneb@itb-inc.com

Responsibilities: Organizes, directs & coordinates program/ technical support activities for the NASA AP2 Program Manager.

Areas of Expertise: Program and project management; technical analysis.

Experience: Sixteen years in environmental field (consulting, manufacturing, research), including two years with NASA. Supported JG-PP since inception (>9 years).

Education: M.S. Environmental Engineering



NASA AP2 Profiles

Kevin S. Andrews



Principal Senior Engineer

Address: NASA AP2 Program Office
Headquarters Bldg., Room 3481
Kennedy Space Center, FL 32899

Tel: 321-867-8477

Fax: 321-867-8479

E-mail: Kevin.Andrews-1@ksc.nasa.gov

Responsibilities: Technical responsibility for development and management of NASA AP2 projects. Centro Para Prevenção da Poluição (C3P) / International Business Entity Lead.

Areas of Expertise: Project Management, Materials Failure Analysis, Civil Engineering Materials, Fabrication, inspection and maintenance of structures.

Experience: Served as a Project and Consulting Engineer on Civil and Environmental projects. Provided engineering support for staff, inspectors, and supervisors in engineering, and failure analysis on facilities and construction materials.

Education: M.S. Eng. (Construction), MBA



NASA AP2 Profiles

Katherine B. Torres



Program Analyst/Coordinator

Address: ITB Southern Office
2460 N. Courtenay Pkwy Ste. 101
Merritt Island, FL 32953

Tel: (321) 453-3838
Fax: (321) 453-3224
E-mail: torresk@itb-inc.com

Responsibilities: Develop, analyze, manage, administrate, and coordinate Program and Project activities and issues for the NASA AP2 Program.

Areas of Expertise: Development and management of information management system tools.

Experience: Four years active military service in the USAF (analyzing, managing, tracking, and updating the evaluation system). One year of Technical support for web based products.

Education: B. S. Computer Information Systems; A.S. Human Resource Management



NASA AP2 Profiles

Cassandra Carroll



Web/Database & Admin Specialist

Address: ITB Southern Office
2460 N. Courtenay Pkwy Ste. 101
Merritt Island, FL 32953

Telephone: (321) 453-3838
Fax: (321) 453-3224
Email: ccarroll@itb-inc.com

Responsibilities: Develops and maintains NASA Acquisition Pollution Prevention (AP2) web site, populates and maintains Integrated Technology Database (ITD), and provides administrative assistance in support of the NASA AP2 Office staff.

Areas of Expertise: HTML and Macromedia Flash MX coding.

Experience: One (1) year plus of Macromedia Flash MX and two (2) years web site development.

Education: A.A. In General Studies; A.S. in Computer Programming



NASA AP2 Profiles

Kurt Kessel



Senior Engineer

Address: NASA AP2 Program Office
Headquarters Bldg., Room 3481
Kennedy Space Center, FL 32899

Tel: (321) 867-8480
Fax: (321) 867-8479
Email: Kurt.Kessel-1@ksc.nasa.gov

Responsibilities: Project integration and Management.

Areas of Expertise: Lead-Free Solder, Solvent Technologies, Opportunity Needs Assessment, Environmental Consulting, Coatings Technology, Metal Finishing Technologies.

Experience: Five Years with the NASA AP2 Program Office, Assistant Project Manager/Developing, Project Integrator – JCAA/JG-PP Lead Free Solder Project.

Education: B.S. Natural Resources and Environmental Sciences



NASA AP2 Profiles

Pattie Lewis



Engineer

Address: NASA AP2 Program Office
Headquarters Bldg., Room 3481
Kennedy Space Center, FL 32899

Tel: (321) 867-9163
Fax: (321) 867-8479
E-mail: Pattie.Lewis-1@ksc.nasa.gov

Responsibilities: Identifies, establishes, and develops environmental technology. Projects and assists to identify, coordinate business, and technical stakeholders from NASA, DoD, and industry to find solutions to common problems.

Areas of Expertise: Project management / Technical analysis.

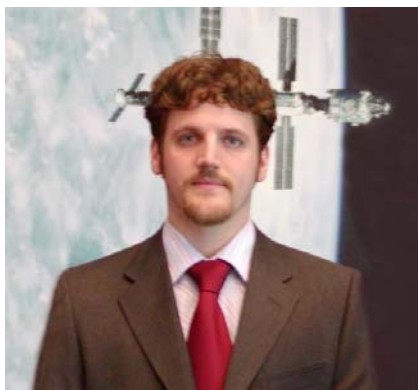
Experience: Two years with USAF as an Environmental Engineer. One year with the NASA AP2 Program Office as a Project Engineer.

Education: B.S. Agricultural and Biological Engineering



NASA AP2 Profiles

Matt Rothgeb



Engineer

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Headquarters Bldg., Room 3481
Kennedy Space Center, FL 32899

Tel: (321) 867-8476

Fax: (321) 867-8479

E-mail: Matthew.Rothgeb-1@ksc.nasa.gov

Responsibilities: Project Development and Management, Pollution Prevention Opportunity Needs Assessments for NASA and C3P.

Areas of Expertise: P2 Needs Assessments, Environmental Consulting, Risk Management, Environmental Monitoring, Natural Resources Management, Project Coordination, Project Development.

Experience: Four years with the NASA AP2 Office, Lead for PPONAs for NASA, Environmental Assessments for the USAF, Superfund site monitoring and Aquatic Ecology Research.

Education: B.S. EHS Natural Resource Management; Industrial Hygiene



NASA AP2 Profiles



John Herrington



Engineer

Address: ITB Southern Office
2460 N. Courtenay Pkwy Ste. 101
Merritt Island, FL 32953

Tel: (321) 453-3838
Fax: (321) 453-3224
E-mail: herringtonj@itb-inc.com

Responsibilities: Project Development, Project Management. DoD knowledge and Interface.

Areas of Expertise: Program Management, Planning and Budgeting, Aerospace Systems, Acquisition Logistics, Production Management, P2 Field Survey.

Experience: Twenty years U.S. Air Force in aircraft maintenance management and Test Program Management. Six Years project Management experience with JGPP (Joint Group on Pollution Prevention)

Education: A.S. in Aircraft Maintenance Technology. Acquisition Professional Development Certification, Program Management and Acquisition Logistics.



Backup



AP2 Projects Roll-up ¹

AP2 Projects Roll-up

Reporting Date: December 31, 2004

Status: Active

(FY = AP2 FY - starts in April)

DIRECT FUNDING				
Source	To Date	FY 2005 POP	FY 2006 POP	Total Direct Funding
NASA AP2	\$ 563,559	\$ 250,000	\$ -	\$ 813,559
NASA Other	\$ 49,993	\$ 395,000	\$ 100,000	\$ 544,993
Air Force	\$ 505,279	\$ 257,000	\$ 500,000	\$ 1,262,279
Army	\$ -	\$ -	\$ -	\$ -
Marines	\$ -	\$ -	\$ -	\$ -
Navy	\$ 75,000	\$ -	\$ 100,000	\$ 175,000
Other Gov't (e.g., ESTCP)	\$ 17,202	\$ -	\$ -	\$ 17,202
Non-Gov't (e.g., OEMs)	\$ 55,000	\$ 50,000	\$ 50,000	\$ 155,000
	\$ -	\$ -	\$ -	\$ -
TOTALS	\$ 1,266,033	\$ 952,000	\$ 750,000	\$ 2,968,033

IN-KIND CONTRIBUTIONS					
Source	To Date	FY 2005 POP	FY 2006 POP	Total In-Kind	Total Budget
NASA AP2	\$ 380,504	\$ -	\$ -	\$ 380,504	\$ 1,194,063
NASA Other	\$ 5,000	\$ -	\$ -	\$ 5,000	\$ 549,993
Air Force	\$ 36,685	\$ -	\$ -	\$ 36,685	\$ 1,298,964
Army	\$ -	\$ -	\$ -	\$ -	\$ -
Marines	\$ -	\$ -	\$ -	\$ -	\$ -
Navy	\$ -	\$ -	\$ -	\$ -	\$ 175,000
Other Gov't (e.g., ESTCP)	\$ 4,000	\$ -	\$ -	\$ 4,000	\$ 21,202
Non-Gov't (e.g., OEMs)	\$ 1,666,984	\$ -	\$ -	\$ 1,666,984	\$ 1,821,984
	\$ -	\$ -	\$ -	\$ -	\$ -
TOTALS	\$ 2,093,173	\$ -	\$ -	\$ 2,093,173	\$ 5,061,206

EXPENDITURES	Prior Years	FY 2005	FY 2006	Total Rec'd	Spent+ Committed	Balance
NASA	\$ 12,993	\$ -	\$ -	\$ 54,993	\$ 54,993	\$ -
Other Gov't Agencies	\$ -	\$ -	\$ -	\$ 4,000	\$ 4,000	\$ -
ITB	\$ 973,425	\$ -	\$ -	\$ 1,276,068	\$ 1,276,068	\$ -
Other Contractor	\$ 108,928	\$ -	\$ -	\$ 237,161	\$ 237,161	\$ -
Non-Gov't (e.g., OEMs)	\$ 769,297	\$ -	\$ -	\$ 1,721,984	\$ 1,721,984	\$ -
Other	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTALS	\$ 1,864,643	\$ -	\$ -	\$ 3,294,206	\$ 3,294,206	\$ -

¹ Projects:

- LFS
- Depainting
- AIU
- Kimetsan
- CCAFS PPOA
- RFID
- LFS Ph 2
- NASA PLCRS
- NASA Parts Washer
- C3P VOC Membrane



AP2 Projects FY 05 Funding Plan

AP2 Projects

Reporting Date: December 31, 2004

Status: Active

Gov't Program Manager: Chris Brown

AP2 POC: Brian Greene, ITB

(FY = AP2 FY - starts in April)

NASA AP2 DIRECT FUNDING						
Project/ Opportunity	Prior Years	FY 2004	FY 2005 Unfunded Requirement (POP)	FY 2005 Emerging Oppty. (POP)	Total Direct AP2 Funding	Comment
DoD-NASA						
Lead-Free Solder	\$ 343,600	\$ -	\$ -	\$ -	\$ 343,600	
Low-Emission Depainting	\$ 16,726	\$ 60,850	\$ -	\$ -	\$ 77,576	
Isocyanate Urethane Alterns.	\$ -	\$ 37,383	\$ 125,000	\$ -	\$ 162,383	FY\$ 04 to purchase lab coupons FY\$ 05 for "Phase 2" testing requirements
Coatings (Kimetsan) for Space Launch	\$ -	\$ 30,000	\$ -	\$ -	\$ 30,000	
CCAFS PPOAs	\$ -	\$ -	\$ -	\$ -	\$ -	AFSPC FY\$ 05
Envir. (RFID) Sensors	\$ -	\$ -	\$ -	\$ -	\$ -	To seek ESTCP FY\$ 05
Lead-Free Solder Ph 2	\$ -	\$ -	\$ -	\$ 75,000	\$ 75,000	FY\$ 05 "seed" money for LFS follow-on
NASA						
Portable Laser Coating Removal	\$ -	\$ 50,000	\$ -	\$ 25,000	\$ 75,000	FY\$ 04 for PLCRS dem/val on GSE FY\$ 05 for PLCRS dem/val on Shuttle parts
Parts Washers	\$ -	\$ 25,000	\$ -	\$ -	\$ 25,000	FY\$ 04 for lab testing of cleaning solutions FY\$ 05 "seed" money for Parts Washer follow-on
C3P						
Membrane Removal of VOCs	\$ -	\$ -	\$ -	\$ 25,000	\$ 25,000	FY\$ 05 for dem/val
Low-VOC/Non-Cr Coatings for Portugal	\$ -	\$ -	\$ -	\$ -	\$ -	
TOTALS	\$ 360,326	\$ 203,233	\$ 125,000	\$ 125,000	\$ 813,559	



AP2 Contractor Support

Full-Time Equivalents (FTEs)

updated: 12/09/04

FY 04 AP2 Labor (FTE)

	Total	Core	NASA	DOD	Int'l	Comments
Program Support	2.98	0.91	0.73	0.40	0.59	
Develop Projects	0.73		0.29	0.38	0.16	
Manage Projects	2.67		0.79	1.73		
no. managed projects	5		4	1		discontinued 1 (CST), but gained 1 (PLCRS)
Support Projects	0.86		0.41	0.12	0.13	
no. supported projects	7		3	3	1	
Monitor Projects	0.06		0.03	0.02	0.01	
Other Efforts	0.70	0.59			0.21	U.S. JOG & Workshop
Total	7.50	1.50	2.25	2.65	1.10	
total no. projects	12		7	4	1	

Forecasted FY 05 AP2 Labor (FTE)

	Total	Core	NASA	DOD	Int'l	Comments
Program Support	2.63	0.91	0.73	0.40	0.59	
Develop Projects	0.83		0.29	0.38	0.16	
Manage Projects	3.02		1.04	1.98		
no. managed projects	6		4.5	1.5		close 1 (parts wash) & add 2 (Membrane & either Spill Sensor + Kimetsan/Zinga)
Support Projects	0.86		0.41	0.12	0.33	
no. supported projects	9		3	4	2	add 2 (JG coating & int'l)
Monitor Projects	0.06		0.03	0.02	0.01	
Other Efforts	0.60	0.59			0.01	
Total	8.00	1.50	2.50	2.90	1.10	
total no. projects	15		7.5	5.5	2	